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REPORT
OF THE
STATE BOARD OF AGRICULTURE
OF
VIRGINIA.

1894.

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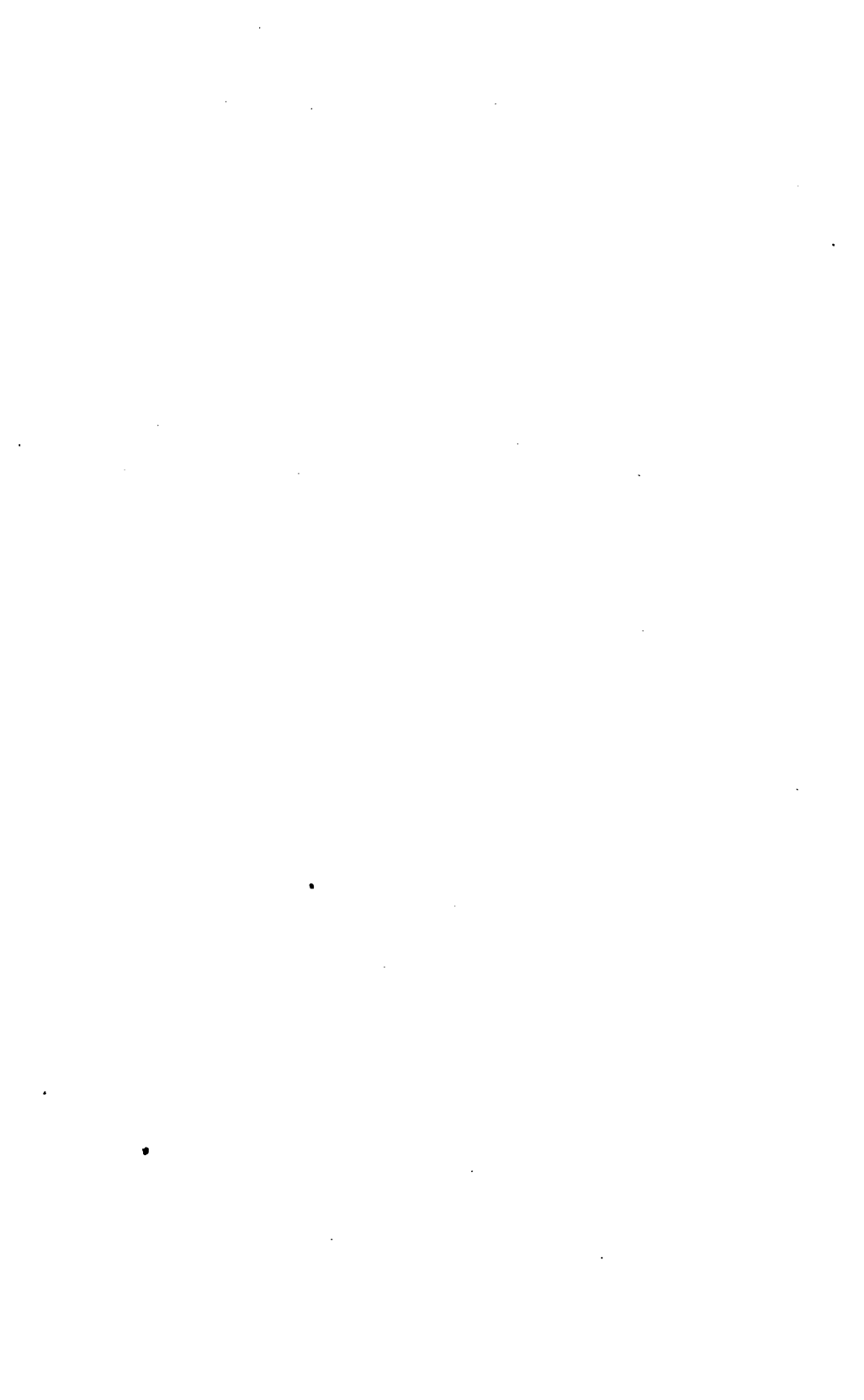
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The Commissioner

20 Oct.

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REPORT

1882.

OF THE

STATE BOARD OF AGRICULTURE

OF

VIRGINIA.

1894.

RICHMOND:

J. H. O'BANNON, SUPERINTENDENT OF PUBLIC PRINTING.

1894.

VIRGINIA STATE BOARD OF AGRICULTURE.

MEMBERS.

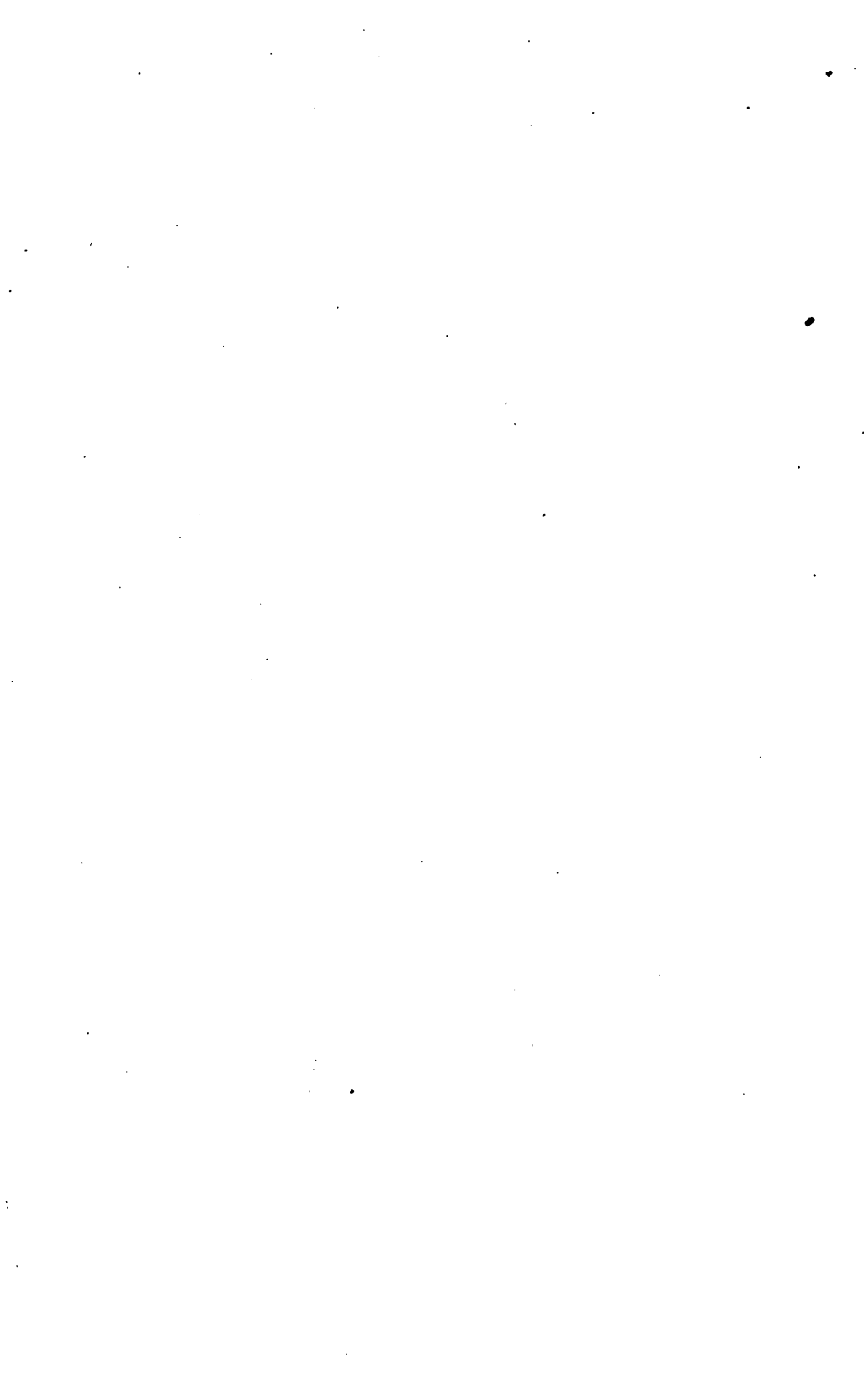
MEMBERS.	DISTRICT.	P. O. ADDRESS.
A. J. McMATH	First Congressional District.....	Onley.
R. L. HENLEY	Second Congressional District.....	Williamsburg.
A. S. BUFORD.....	Third Congressional District.....	Richmond.
R. M. MALLORY.....	Fourth Congressional District.....	Smoky Ordinary.
JOHN L. HURT.....	Fifth Congressional District.....	Hurt's Store.
R. V. GAINES.....	Sixth Congressional District.....	Mossingford.
J. K. McCANN.....	Seventh Congressional District.....	Stephenson.
S. WELLFORD CORBIN..	Eighth Congressional District.....	Comorn.
H. C. STUART.....	Ninth Congressional District.....	Elk Garden.
ABSALOM KOINER.....	Tenth Congressional District.....	Fishersville.
THOMAS WHITEHEAD..	Comm'r of Agriculture (<i>ex-officio</i>).	

OFFICERS OF THE BOARD.

PRESIDENT S. WELLFORD CORBIN..... Comorn.
 SECRETARY AND TREASURER.. THOMAS WHITEHEAD..... Richmond.

OFFICERS AND EMPLOYEES OF DEPARTMENT.

COMMISSIONER OF AGRICULTURE..... THOMAS WHITEHEAD.
 CHEMIST..... RICHARD H. GAINES.
 ASSISTANT CHEMIST..... G. J. L. DE CHALMOT.
 INSPECTOR OF FERTILIZERS..... IRVING P. WHITEHEAD.
 CLERK..... H. G. BUCHANAN.
 MESSENGER..... HAROLD L. JOBSON.



REPORT

OF THE

STATE BOARD OF AGRICULTURE.

To His Excellency CHARLES T. O'FERRALL,
Governor of Virginia :

SIR :

Pursuant to law, this seventh annual report of the Virginia State Board of Agriculture is respectfully submitted, together with the annual report of the Commissioner of Agriculture, in which he presents in detail the operations of his department for the past year, to which attention is invited.

The Virginia State Board of Agriculture, created by act of Assembly of the 5th day of March, 1888, is composed of ten members, appointed by the Governor, one from each congressional district in the State, together with the Commissioner of Agriculture, who is *ex officio* a member of the Board, and who acts, in obedience to the provisions of the statute, as secretary and treasurer of the Board. The aim and intent of the law creating the Board was clearly with the view of benefiting the agriculturists of the State.

Practical farmers of more than average intelligence were selected to serve upon the Board. These men have judiciously and economically administered the annual fund appropriated. They have faithfully devoted their time, without pay or emolument of any kind, to the attainment of the end. They have drawn upon the rich stores of their experience as practical farmers who make their living by agriculture, and are thoroughly conversant with the wants and needs of the calling they represent.

During the past six years the Virginia State Board of Agriculture has, by report pursuant to law, and by bills formulated and presented to the legislative branch of the State government, urged the necessity of the enactment—

- Of an equitable fertilizer law ;
- Of a sound and wise general road law ;
- Of a fair and comprehensive drainage law ;
- Of a law to encourage immigration ;
- Of a State Weather Service Bureau, to act in connection with and receive the aid and benefits offered by the Federal government ;
- Of a law authorizing the expenditure of money in holding farmers' institutes ;
- Of a law for the inspection and testing of field seeds used by the farmers of the State ;

Of a law modifying the present usury laws and those governing the rate of interest charged for the use of money ;

Of the appointment of a competent geologist and mineralogist for the State ;

Of a law for the protection of sheep, placing a revenue value upon the enemies of the same, and thus rendering a double benefit to the tax-payers of the State ;

Also of a law for the equalization of taxation ;

And a law compelling the commissioners of the revenue to furnish the Commissioner of Agriculture data pertinent to and necessary for a correct recital of statistical information required by the farmers of the State, and which cannot be obtained in any other way except by large expenditure of money.

To all and every one of the suggestions enumerated above the Legislature has turned a deaf ear.

It is an object lesson and an instructive commentary upon the policy now pursued by our legislators, when we look in the statute books of Virginia in vain for any law now in force authorizing the promotion and encouragement of immigration. Even the dissemination of information as regards the fertility of our soil and the desirability of Virginia for homes, published in the annual reports of the Commissioner of Agriculture, is restricted to distribution within the State. He is not authorized by law to send one copy of his report out of the State. This lack of co-operative sustainment of the efforts of the Board has been to them the source of great disappointment and of disheartening embarrassment in the discharge of their duty, as they conceive it to be, for the benefit of their constituents.

Although the suggestions of the Board have failed to impress the members of the Legislature so as to induce them to enact the laws recommended, they have, to a limited extent, been put to a practical test, with most acceptable and satisfactory results.

Farmers' institutes are a need and a success.

Tentatively the Board has accepted some of the benefits offered by the Federal Weather Service Bureau.

After laborious research and careful comparison of methods, the Board formulated and put into operation a plan to promote and encourage immigration. Before the seed planted had time to germinate, when the plan was in its incipency, harsh and captious criticism, coupled with the knowledge that there was no law authorizing the expenditure of money to encourage immigration, induced the Board to abandon it. There were indications sufficient, however, to compel the belief that if the work had been persisted in very great benefit would have accrued to the State.

The fertilizer law, while not fair nor equitable, and not embracing provisions recommended by the Board, has been faithfully administered, with the assistance of competent chemists and a vigilant Commissioner, and has secured to the farmers of the State immunity from fraud and imposition in the purchase and use of fertilizers. A noteworthy feature of this law, proving the confidence the members of the Assembly have in the integrity and ability of the *personnel* of the Board, is the large power vested in the Board to finally (and absolutely without appeal) adjudicate all cases of appeal from the decision of the Commissioner in regard to the purchase and use of fertilizers where fraud is alleged. Such a case was decided in January last at Norfolk, involving some \$2,600, between the Standard Guano Company and J. G. Eberwine. Whether it is judicious to thus invest this Board (even with restricted jurisdiction) with like power with the Court of Appeals is a question for future experience to determine.

The want of concerted action between the Board and the Legislature suggests criticism in regard to the policy of the administration of affairs touching agriculture in the State. To foster, to attain, and to accomplish a common end, we have now in the State of Virginia—

First. A Commissioner of Agriculture, whose duties are complex—those prescribed by statute, in which he acts independently, and those attaching to his connection with the State Board of Agriculture.

Secondly. A State Board of Agriculture, whose duties are not clearly defined by statute, and who are left to expend the appropriations pretty much as they see proper. Under these circumstances, and as a protection to themselves, the Board has inaugurated and enforced a most exact and admirable system in the disbursement of the fund appropriated, and are at all times prepared to exhibit itemized accounts, with warrants and vouchers, for all moneys paid out, and for what purpose.

Thirdly. An Agricultural and Mechanical College, controlled by a Board of Visitors appointed by the Governor and confirmed by the Senate, which board elects the superintendent and professors employed at the college, formulates the policy to be pursued in the conduct of the institution, and in addition appoints the director of the Experiment Station and controls and directs his work. Neither our Commissioner of Agriculture nor State Board of Agriculture has anything whatever to do with the Experiment Station, and can in no manner shape or control the management of this most important factor touching the interests of agriculturists.

Thus your Excellency will note that we have three separate and distinct agencies in Virginia, each acting independently one of the other, to accomplish a common end.

You will readily appreciate that if there was only one agency this work would probably be done more efficiently and economically than as now attempted.

It would be well for you to disabuse your mind of any hastily-assumed conviction that these three powers clash and are jealous one of the other. We all get along very harmoniously, but we realize that if the law did not hold us apart, and if we could act as a unit, we would accomplish much more and better work than now.

As the president of the Virginia State Board of Agriculture, I wrote to Dr. J. M. McBryde, president of Virginia Agricultural and Mechanical College, asking him what percentum of the graduates of the college followed the pursuit of agriculture. His reply was that no record was kept, and that he could not furnish the information.

In answer to my letter to the Hon. J. Sterling Morton, Secretary of Agriculture, as to the policy pursued in the different States in regard to the management of the experiment stations supported by Federal subsidy, and also the consensus of opinion resulting from experience, in the old as well as in the new States, as regards the best means by which to accomplish good for the agriculturists, he replied through the Hon. C. W. Dabney, Jr., Assistant Secretary: "It would take several months, at least to compile the information asked for in your first letter." A copy of his letter, which contains much valuable and interesting information, is herewith filed as part of this report. (See Appendix A.)

The Board is thoroughly impressed with the belief that great benefit is to be derived from the establishment of out-lying culture stations as supplementary to the work of the Experiment Station at Blacksburg. The attention of our farmers

should be drawn to the pecuniary benefit to be derived from the product of the sugar-beet. By ocular demonstration, the object lesson of the out-lying culture stations will teach the farmer, in the different sections of the State, what crops are profitable for him to cultivate, what fertilizers produce the best results in this section, and what is the best and most economical system of cultivation. The difference in soil, climatic conditions, and propinquity to market are all moving factors governing the policy pursued by the farmers in the different sections of the State.

One experiment station, at Blacksburg, in the almost extreme southwest portion of the State cannot alone render the benefit to all the agriculturists of the State that was contemplated when the Federal appropriation was made.

During the past seven years the Board has received in appropriations from the Treasury of the State the sum of \$73,000. They have turned back into the Treasury, from fertilizer fees and unexpended balances, the sum of \$44,376 33—showing a net cost of the department during this time of \$28,623 67. (See Appendix B.)

The reports of the Commissioner of Agriculture and of the Board show in detail for what this sum has been expended.

The smooth and admirable manner in which the fertilizer law is administered, affording ample protection to our farmers in the purchase and use of fertilizers, is a testimony to the good work accomplished.

Drawn, as this Board is, from private life, with a conscientious regard for the best interests of their constituents, we are constrained to say that, unless the appropriation and the field and the scope of our labors are both enlarged, we see no necessity for its continuance simply as a board of overseers to supervise the office work of the commissioner. That the Board should have its field of labor enlarged, with an appropriation at its disposal commensurate with the deserts of the agriculturists of the State, we most heartily recommend.

A possible wise enlargement of the field of our labors would be to establish by law closer relations of this Board with the Virginia A. & M. College in the direction of the control of the experiment station and thus enable us to use this admirable engine for the instruction and profit of the farmers all over the State.

Very respectfully submitted,

S. WELLFORD CORBIN,

President of the Virginia State Board of Agriculture.

Sept. 25, 1894.

APPENDIX A.

[A Copy.]

DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C.,
OFFICE OF ASSISTANT SECRETARY,

*June 21, 1894.**Hon. S. WELLFORD CORBIN, Comorn, Va.:*

DEAR SIR:

Upon my return to this office, after an absence of two weeks, I find your esteemed communication of the 11th instant. Please pardon the delay of this reply.

I was fully aware of the unsatisfactory nature of my reply of the 22d of May to your letter of the 12th of May, addressed to the Hon. Secretary of Agriculture, but, as I explained therein, as the State boards of agriculture have no connection whatever with this department, the department has never deemed it proper to compile their laws or investigate their methods, and therefore we had very little information upon file on which to base a reply to your numerous inquiries with regard to them. It would take several months, at least, to compile the information asked for in your first letter. I take pleasure in forwarding you herewith a copy of the last organization list of the agricultural experiment stations. As this has been published annually for a number of years, I assumed, at the time of writing to you before, that you were already in possession of the information contained therein.

Inferring from your letter of the 11th instant that your attention has not been drawn to it, I have compiled the following statements with regard to the relations of the agricultural experiment stations to State boards of agriculture.

In most States the governing board of the station is the board of trustees of the college with which the station is connected, and usually this board is entirely separate and distinct, as it is in Virginia, from the State Board of Agriculture. It may be that members of State boards of agriculture are in some cases also members of college boards, though not so *ex officio*.

In only two States—Colorado and Michigan—is the State Board of Agriculture the governing board of the agricultural experiment station.

In Connecticut the Board of Agriculture and the State Agricultural Society each appoint one member of the station board.

In Georgia the Commissioner of Agriculture is the president of the station board.

In Louisiana the Commissioner of Agriculture is a member of the station board.

In Maine the secretary of the State Board of Agriculture is an advisory member of the station council.

In Massachusetts the secretary of the State Board of Agriculture is also secretary of the station board, and two members of the station board are appointed from the State Board of Agriculture.

In Texas the Commissioner of Agriculture is a member of the station board.

In New Jersey the director of the State station is a member of the State Board of Agriculture.

This information is, of course, obtained through the office of experiment stations of this department. I regret exceedingly that neither this office, nor any here, is in possession of all the information which you seek. Under our system of government none of the executive departments presume to have supervision or control over any State offices or boards; therefore, no direct correspondence is usually carried on between this department and the State departments or boards.

I can cite only one instance where steps have recently been taken (since the organization list referred to was published) to connect the State Board of Agriculture with the board of trustees of the agricultural college governing the station.

At the last meeting of the board of trustees of the University of Tennessee (which is the agricultural college of that State) the present Commissioner of Agriculture of Tennessee was nominated by the General Assembly of that State as a member of the board of trustees of said university, the desire being to connect him with the institution in this way. It will take an act of the General Assembly itself to make him an *ex-officio* member of the board. This was done at the instance of the Governor and the Superintendent of Public Instruction and by a unanimous vote of the board itself.

I have to state again my regret at the incompleteness of this reply to your inquiries. If I can find any additional information in the future I will take pleasure in forwarding it to you. At present I can only suggest that, in order to get all of the facts you want, it will probably be necessary for you to communicate directly with the Secretaries of State of the various States and Territories. I presume if you address them they would send you copies of the laws and regulations of the different agricultural boards in their respective States.

I am, with warm regards, very truly yours,

CHARLES W. DABNEY, JR.,
Assistant Secretary.

APPENDIX B.

YEAR 1888.

Appropriation.....	\$10,000 00
Received from tax on fertilizers.....	6,440 00
Total receipts.....	<u>\$16,440 00</u>
Expenditures.....	5,808 50
Lapsed into State Treasury.....	<u>\$10,631 50</u>

YEAR 1889.

Appropriation.....	\$10,000 00
Received from tax on fertilizers.....	5,980 00
Total receipts.....	<u>\$15,980 00</u>
Expenditures.....	10,000 00
Lapsed into State Treasury.....	<u>\$ 5,980 00</u>

YEAR 1890.

Appropriation.....	\$10,000 00
Received for tax on fertilizers.....	8,100 00
Total receipts.....	<u>\$18,100 00</u>
Expended on fertilizer account.....	\$3,034 13
Expended on general account.....	5,412 13
	<u>8,446 25</u>
Lapsed into State Treasury.....	<u>\$9,653 75</u>

YEAR 1891.

Appropriation.....	\$10,000 00
Received from tax on fertilizers.....	7,600 00
Total receipts.....	<u>\$17,600 00</u>
Expended on fertilizer account.....	\$4,233 29
Expended on general account.....	5,901 91
	<u>10,135 20</u>
Lapsed into State Treasury.....	<u>\$7,464 80</u>

ANNUAL REPORT OF THE

YEAR 1892.

Appropriation.....	\$10,000 00
Received from tax on fertilizers.....	8,600 00
Total receipts.....	<u>\$18,600 00</u>
Expended on fertilizer account.....	\$4,657 84
Expended on general account.....	9,470 78
	<u>14,128 62</u>
Lapsed into State Treasury.....	<u>\$ 4,471 38</u>

YEAR 1893.

Appropriation.....	\$10,000 00
Received from tax on fertilizers.....	8,800 00
Total receipts.....	<u>\$18,800 00</u>
Expended on fertilizer account.....	\$6,481 35
Expended on general account.....	7,585 72
	<u>14,067 07</u>
Lapsed into State Treasury.....	<u>\$4,732 93</u>

YEAR 1894.

Appropriation.....	\$10,000 00
Received from tax on fertilizers.....	9,180 00
Total receipts.....	<u>\$19,180 00</u>
Expended on fertilizer account.....	\$7,156 88
Expended on general account.....	4,401 15
	<u>11,558 03</u>
Lapsed into State Treasury.....	<u>\$7,621 97</u>

RECAPITULATION.

Total receipts from 1888 to 1894, inclusive of both years.....	\$118,520 00
Total expenditures in above period.....	<u>74,143 67</u>
Total amount which has lapsed into the State Treasury since the establishment of the Board of Agriculture.....	<u>\$44,376 33</u>

ANNUAL REPORT
OF THE
COMMISSIONER OF AGRICULTURE
TO THE
STATE BOARD—1894.

DEPARTMENT OF AGRICULTURE,

September 30, 1894.

To the President and Members of the State Board of Agriculture:

GENTLEMEN:

I have the honor to present the following report of the work done and money expended in this department for the fiscal year ending September 30, 1894:

The work of the department has been increasing each year since my administration of its affairs.

The examination of minerals and ores, the tests of soils and fertilizing materials is much greater. The reports of insects and diseases affecting plants and diseases of stock is yearly increasing, and hence the necessary investigation to suggest remedies is greater than ever before.

This year there has been a greater necessity for the services of a veterinary surgeon and entomologist under the control of the Commissioner, more applications having been made to him by farmers suffering from diseases among stock and the depredation of insects, new and old.

No applications for farmers' institutes have been filed with your Commissioner, except from the Tenth and First Districts. For satisfactory reasons the one in the Tenth was passed by and the one in the First was arranged for the 3d of October.

The matter of holding farmers' institutes is left by resolution with the member of each district, to whom your Commissioner refers all applications for institutes made to him.

The Commissioner has been perfecting as far as possible the system of collecting statistics of the resources of the State, and has very considerably enlarged the range of investigation. The department has to depend for its information entirely upon the courtesy and public spirit of voluntary correspondents with whom the Commissioner is in communication. The reports and bulletins made from these statistics have given general satisfaction.

The system of inspection of fertilizers has been closer and more rigid than heretofore, and analyses more promptly made and published than heretofore.

More work has been accomplished this year in the fertilizer control than heretofore, and has given satisfaction to both farmers and dealers. Some amendments to the fertilizer act, which appear to have been overlooked, are necessary to prevent friction and inconvenience in carrying out the law, but with extra labor and care it has been made a success this year.

The appropriation reported to the credit of the board by the Auditor was \$13,000, \$3,000 of which was set apart from the fund derived from the fees on fertilizers "for all expenses in the collection of taxes on fertilizers and fertilizing companies." The fees collected from the tax on fertilizer manufacturers by the Commissioner and paid into the treasury of the State were \$9,180. The cost of executing the fertilizer law this fiscal year was \$7,156 88, with no allowance for collection or disbursement. This necessitated a charge of \$4,156 88 against the annual agricultural appropriation of \$10,000.

The itemized account of the Commissioner as treasurer of the Board shows a total expenditure by the department for all purposes of \$11,715 83; hence there lapsed into the treasury of the State of the \$13,000 placed to the credit of the board at the beginning of the fiscal year 1894-5, \$1,284 17.

Out of taxation there was appropriated for general agricultural purposes \$10,000. This department paid into the treasury balance from fertilizer fees, \$6,180, and there lapsed into the treasury from the \$10,000 appropriation, including, as a charge against this fund, the \$106 02 expended above the \$3,000 allowed for fertilizer control, \$1,284 17, making a total of \$7,464 17 which went as a credit to the \$10,000 appropriated, leaving \$2,535 83 as the cost of the Department of Agriculture to the tax-payers of Virginia.

It is with pleasure that I report that the employees of this department have performed their duties faithfully and satisfactorily to the Commissioner.

I herewith submit my annual report to the Governor of Virginia; also the reports of the chemist, inspector, and assayer of minerals at the Virginia Agricultural and Mechanical College, made to me.

THOMAS WHITEHEAD,
Commissioner of Agriculture.

SIXTEENTH ANNUAL REPORT

OF THE

COMMISSIONER OF AGRICULTURE.

To Hon. CHARLES T. O'FERRALL,

Governor of Virginia:

SIR:

The Code, in defining the duties of the Commissioner of Agriculture, says in the seventh paragraph of section 1788: "He (the Commissioner of Agriculture) shall, moreover, on the first day of November of each year make a report to the Governor, who shall communicate to the General Assembly at its first session thereafter. * * * He shall state in his report what official duties he has performed during the year, and give such information and make such suggestions touching the agricultural interests of the State as he may deem useful."

The second section of an act to provide for a Board of Agriculture of Virginia makes the Commissioner of Agriculture a member *ex-officio* of the State Board and the secretary and treasurer of the same. The fourth section requires him to apply the annual appropriation, "under the orders and directions of the said Board"; provides that "an itemized statement of all expenditures, supported by proper vouchers, filed in the office of said treasurer, shall be published in the annual report of the Commissioner and Board of Agriculture for the information of the Governor and General Assembly. By the act known as the fertilizer act, approved February 24, 1890, amended by act of March 8, 1894, the duties and responsibilities of the Commissioner of Agriculture, as set out in the second paragraph of the 1788th section of the Code, defining his duties, are changed, and he, by implication, is required to report to the Governor additional matter and another account of receipts and expenditures.

Since my last report the funds at the disposal of the Board of Agriculture have again been changed. An act was passed by the Legislature (see Acts 1893-'94, page 917) which added \$1,500 to the annual appropriation of \$10,000, to be taken from the receipts of fertilizer inspection. This was enlarged by the appropriation bill (see same acts, page 908) to \$3,000, to be taken from the receipts of fertilizer inspection, making the whole amount at the disposal of the Board \$13,000.

By reference to my itemized accounts of receipts and expenditures, accompanying this report, your Excellency will see that \$9,180 was received from the fertilizer fees, and after deducting the \$3,000 placed to the credit of the Board by the Auditor of Public Accounts under the appropriation bill there was left in the

treasury of the State from deposits of the fertilizer fees made by your Commissioner \$6,180. The same account will show that all expenditures made by this department were \$11,715 83, leaving to lapse into the treasury unused \$1,284 17 of the \$13,000 appropriated, which, added to \$6,180 from fertilizer fees, makes \$7,464 17, which is really a credit against the \$10,000 appropriation, thus the department cost the tax-payers of the State only \$2,535 83.

The act of March 29, 1877 (mentioned in the agricultural bill), is made chapter 81 of the Code of Virginia, and under a strict construction of the agricultural bill, creating the State Board of Agriculture, there might be collected from fertilizer inspection and control, without materially altering the fertilizer law, a sum sufficient to carry out, with economical management, all the purposes directly provided for by these acts without the special appropriation of \$10,000.

The analysis of soils, assay of minerals, the institution of the State weather service, farmers institutes, and immigration are not directly required by nor provided for in the agricultural bill nor the act creating the Department of Agriculture.

The efforts of the department to satisfy the desires of the people in regard to these subjects have increased the labor of the department and required a considerable expenditure of money, there being no appropriation to carry out the acts for soil analyses and the assay of minerals. I repeat, therefore, my suggestion in former reports that legislation reducing into one act all the duties and requirements, and making plain the powers of the board and the duties of the commissioner, would be of great advantage to the public service.

The act of March 29th directs the performance of the following duties on which I report in the order named in the act:

First. *To Prepare a Handbook.*—A book, entitled "Virginia, A Handbook," was prepared by me, and twelve thousand copies issued, and there are now on hand at this department 2,340 copies of the book.

They have not been wasted, but have been judiciously placed in the hands of parties in other states and foreign countries who are looking to a change of homes. Many persons who have received this book have visited this State, and the number is daily increasing. Numerous applications for the publication are received at this office daily. It has been commended in and out of the State, and publicly and privately for its truthfulness, fairness and conservatism, and it has borne fruit in giving the present impetus to the enquiry after Virginia lands and minerals.

Second. *To Examine and Test Fertilizers.*—The work under this head has been satisfactorily and promptly done. The use of fertilizers is increasing, and the judgment exercised by the farmers in their use has greatly improved. Every State department and every farmer testifies to the value of fertilizer analyses and inspection, if analyses are promptly made and published. This year the department pressed the analyses both during the spring and fall seasons, and bulletins were more frequently issued than heretofore. The department has succeeded in settling nearly all disputes, and has prohibited the continued sale of worthless fertilizers. Under the new law, many small dealers and grinders of bone have begun business. The fertilizer law needs some corrections by amendments which were overlooked in some way by the last legislature, but which can be easily remedied. The reports of the Inspector of Fertilizers and the Chemist herewith filed, will give the details of this work.

The work this year in the field and the laboratory has been larger than any previous year in the history of fertilizer control in this State. There has been received

from the tax on fertilizers this year \$9,180, of which sum \$6,180 remains in the treasury of the State. Without increasing the tax, the control of fertilizers in Virginia, as it does in other states, would produce a sufficient fund to secure ample protection to the consumers and dealers, and encourage honest manufacturers. It would be sufficient to provide for all those matters set forth in the act creating the department which belong particularly to agriculture and the successful cultivation and production of crops designated in the act as "special investigation of matters pertaining to agriculture." This section directs that "he (the commissioner) shall enquire into and investigate matters pertaining to the cultivation of the soil and raising crops, horticulture and fruit growing, the dairy, cattle, sheep-raising, diseases of fruit, grain and other crops and the remedies therefor, injury to crops by insects and the prevention thereof.

Now all these require the use of the laboratory and the labor of the chemist, nor can proper investigation be made without this department which has produced by its work and the oversight of the commissioner over \$9,000. The "distribution of seed" provided for by the act could also be carried out and the publication of all bulletins of crops and fertilizer analyses and the collection of statistics. It would likewise be sufficient for the present voluntary weather service bureau and its improvement, and in fact this fertilizer fund would provide for all that appertains directly to agriculture and the scope of this department in regard to remedies for diseases of cattle and stock and injuries to crops and fruit might be enlarged.

It would also provide a reasonable fund for farmers institutes, which are directly connected with the use, application and value of fertilizers. This would leave the regular appropriation to be applied to immigration, mining and manufacturing, the collection of minerals as required by law and increase of publications advertising the resources of the State, and this would obviate the expense of a separate bureau of immigration, mining and manufacturing, and the salaries of separate officials. The appropriation of \$10,000 now made would be ample to carry out an effective bureau of immigration, keep up the cabinet collection of minerals also; investigate mining and manufacturing, collect statistics, and publish handbooks, and advertise the resources of the State as was intended by the agricultural bill under which this continual appropriation was made, and this division of the subjects of investigation and enquiry would with a few amendments render perfect the agricultural bill passed by the legislature of 1887-'88.

An examination of the act of 1887-'8, creating the State Board of Agriculture, will show that it was the intention of the legislature to embrace all the subjects to which I have alluded in the provisions of that act, but many failed for want of specific and direct provision.

Third. *Mining and Manufacturing.*—The exact duty required by the act has been discharged, that is to collect statistics and make report thereof. This has been done as fully as possible, and every new mine or factory investigated and reported. Mining is slowly developing and increasing. The movement, though slow, is steady and reliable. The minerals of Virginia are varied, rich and well located, and in the end will prove a great source of wealth. The report of assays made by the Virginia Agricultural and Mechanical College under the arrangement made for the work by the State Board of Agriculture, shows the examination made for the benefit of land owners.

Fourth. *He Shall Establish a Cabinet of Minerals.*—This has been done and added to every year, until the collection in the range and size of specimens is equal to

any in the country. It contains specimens of all the minerals of the State, including a wide range of clays and stones. The public building provided for the department cannot possibly accommodate the large collection now gathered by this department. The present exhibit is very large and many of the specimens of great weight. A splendid cabinet for the new building could be made of selected specimens reduced in size and fitted for exhibition, and still leave enough for a large, permanent exhibit in their crude state at some proper place. If the Virginia State Agricultural and Mechanical Society would take the care and control of the collection thus remaining over, it might be the best place for its permanent exhibition. At not great expense, the board, if authorized by law, might prepare specimens of all the collection, and turn the balance over to the said society.

Fifth. *Special Investigation of Matters Pertaining to Agriculture.*—This year the host of insect pests has increased, and fungus diseases have attacked more vegetables than usual. This department of work becomes more important every year, as trucking enlarges and becomes more profitable. The Commissioner of Agriculture has no authority to employ an entomologist, but has used as far as possible the kind offices of the United States Department of Agriculture, and the Virginia Agricultural and Mechanical College, and the Experiment Station at Blacksburg. He has had many applications for remedies for the depredation of insects and ravages of the diseases of crops, and has given such information as he possessed in regard to this matter. Many new insects have been described or sent to the department for identification, and such information given the parties as was at my command. I have also received many plants and grasses for identification, among them the Russian Thistle, which hybridizes with weeds of the same species which grow here. When young it is greedily eaten by hogs, and can be eradicated by fallowing before it blooms.

I have greatly to regret the lack of authority to command the services of a veterinary surgeon, as most distressing complaints have come to the department from some localities of serious and fatal diseases among stock. Fruit growing has engaged but little of the attention of the department this year, as practically we have had no fruit except grapes and blackberries. Trucking has increased, and where the truckers have good transportation to more than one market, it has been profitable. The products of the dairy and poultry yards have increased, and the low price of farm staple crops has attracted to them a great deal of attention. Irrigation has but a small place in Virginia agriculture, and is no where a necessity. Drainage is important, and there should be legislation for a general system in Tidewater Virginia. Enclosures, the last subject under this head, is locally controlled in every section. In fact every county has a fence law to suit its people.

Sixth. *The Distribution of Seeds.*—The board has made no distribution of seeds since the discontinuance of the supply from the United States Department of Agriculture. Distribution of bought seed has been found not to repay the cost in value to the people, and until the experiment stations or State farms produce seed of new and best variety, carefully watched against mixture, and carefully harvested, there is little advantage in any distribution. Experiments in seed production must be under the supervision of experts. Seed inspection would be valuable to truckers and grass growers especially.

Seventh. *Public Information.*—The department publishes reports and bulletins giving information and statistics of most matters with which it is connected. Its bulletins of fertilizer analyses, its monthly report on crops, fruit, stock, pastures,

&c. ; its midsummer and annual crop reports, mineral and timber statistics, trucking, poultry, and dairy statistics are published, and the reports of the weather service were regularly sent out. The department is in communication with a considerable number of the best agriculturists in every county, and their voluntary work giving information is highly appreciated by the Commissioner. A system of collecting statistics such as is carried out by law in North Carolina, Texas, and other States, through tax assessors, would add much to advertising the State. Of matters not specified by the act as duties, but which the board, under a "general welfare" clause, have to some extent carried out for the benefit of the farmer, I may report on immigration, farmers' institutes, labor, &c.

On the subject of immigration, I cannot do better than to extract from a former report: "In Virginia to-day there are several million acres of arable uncultivated land, grown up in sedge grass and old-field pine. That these acres will produce abundantly under proper management and cultivation is shown by the harvests cut from them in *ante-bellum* days and the waving crops of grass and grain now being produced upon some tracts of these lands recently purchased and now being cultivated by northern parties. These lands can be bought far below their real intrinsic value. We have climate that is unsurpassed—a mean between the extreme cold of the North and the heat of the South. We enjoy the blessings of good government and domestic peace and tranquility. Our people are noble, generous, and hospitable. These considerations should make Virginia one of the most attractive fields for immigration in the Union. There is now a spirit of unrest in the Northwest. Former immigrants are becoming to a great extent dissatisfied with their prospects on the cold and blizzard-beaten plains of the West, and are to-day turning their eyes to a more genial clime. Now is the time for action."

There are no legislative provisions to enable the Board of Agriculture to meet the exigencies of this important question. There is no authority by which that body can carry out any very effective measures for securing these immigrants. The Board has endeavored, by the distribution of publications, to bring the resources of Virginia before the eyes of these inquiring people looking for homes. The recently-published hand-book has been distributed generously throughout the North and Northwest, and many copies have been sent to England, Ireland, Germany, and Scotland. This work has not been without results, but does not meet the demands. I would suggest that the Legislature take this matter in hand and in their wisdom formulate some system by which these immigrants can be successfully reached.

Farmers' Institutes.—A system of farmers' institutes was inaugurated by the Board, depending for success mainly on the work and activity of the members from the respective districts. Their great value in practically educating the farmers in specialties, such as dairying, fruit-growing, poultry-raising, trucking, and in the practical use of remedies for the diseases of stock and plants, in preventing the depredation of insects, preparation of products for market, and the various economies of agriculture has been demonstrated in other States where special appropriations are made and in Virginia in such districts as have had the enthusiastic efforts of their member of the Board. Some years the extra labor entailed on the Commissioner was very great, but he gladly rendered it because he was satisfied he saw valuable and practical results from the work.

The Board at its May meeting adopted the following resolutions:

First. That a sum not exceeding \$75 be appropriated out of any money at the disposal of the Board not otherwise appropriated, to be used in the defraying the expense of holding farmers' institutes in each of the ten congressional districts in the State, and that said amount so appropriated for each district shall only be expended under the direction and with the approval of the member from such district and the Commissioner of Agriculture.

Second. That in order to carry out the purpose and the intention of the above resolution, it shall not be necessary to first obtain a given number of signatures that an institute be held, but that the member of the Board residing in the district shall be authorized to convene the farmers at such time and place as he may deem advisable.

No institutes were held and this appropriation lapsed into the treasury.

Labor.—It was the intention of the Legislature to provide for the collection of agricultural, labor, and industrial statistics, and the investigation of this important matter so vitally affecting agriculture, but it failed to provide for the expenditure of money. The department, however, has endeavored without expenditure of money, through its correspondents, to secure practical statistics in regard to the labor in Virginia. The wages of agricultural labor in Virginia are low compared with other States, but where the labor is fed by the employer the liberality in this regard on farms increases the real value of the employment beyond what it is in most States paying larger money payment. The prices are about what they have been for several years, and labor in Virginia, if not perfectly contented, is reasonably faithful and law-abiding. We have no Coxey soldiers and a very inoffensive order of tramps.

Notwithstanding complaints and grumbling, the condition of those who own and cultivate the land in Virginia is safer and better than other occupations. We have had several years of plenty in succession. Of many crops the "earth has brought forth by handfuls." The scarcity of money and the contraction of credits has made the farmer more economical and has forced the sale of remnants of crops and small productions and the reduction of unnecessary stock. The men who own their farms and whose families do their own work are fairly prosperous. The necessary investment of capital is less than formerly. Land, stock, implements, fertilizers, and seeds are cheaper. A full diversification of crops with intensified farming for cultivated crops, and extensive farming for pastures and stock, with the farm adjuncts of the dairy, poultry-yard, and the orchard, affords reasonable escape from the low prices of staple crops. Virginia is better off than most States, taking into consideration capital required for farming, climate, range of production, facilities for transportation, and proximity to large markets.

Altogether the agricultural classes of Virginia have cause for gratitude to a kind Providence and should be encouraged to a reasonable contentment.

Very respectfully submitted,

THOMAS WHITEHEAD,
Commissioner of Agriculture.

REPORT OF EXPENDITURES

OF

THE AGRICULTURAL DEPARTMENT

BY THE

COMMISSIONER, AS SECRETARY AND TREASURER OF
BOARD, FROM 1ST OCTOBER 1893, TO 30TH
SEPTEMBER, 1894.

FARMERS' INSTITUTES.

1894.		
Sept. 29.	To A. J. McMath, chairman, expenses institute at Tappahan- nock, First district, warrant 1,101.....	\$75 00

GENERAL FUND.

SALARIES OF EMPLOYEES.

1893.		
Oct'r 31.	H. L. Jobson, salary, messenger, October, warrant 902.....	15 00
	William Baker, salary, porter, October, warrant 903.....	12 50
Nov'r 29.	H. L. Jobson, salary, messenger, November, warrant 916.....	15 00
	William Baker, salary, porter, November, warrant 917.....	12 50
Dec'r 23.	H. L. Jobson, salary, messenger, December, warrant 927.....	15 00
	William Baker, salary, porter, December, warrant 928.....	12 50
1894.		
Jan'y 31.	H. L. Jobson, salary, messenger, January, warrant 947 ...	15 00
	William Baker, salary, porter, January, warrant 948.....	12 50
Feb'y 28.	H. L. Jobson, salary, messenger, February, warrant 954.....	15 00
	William Baker, salary, porter, February, warrant 955.....	12 50
Mar'h 24.	I. P. Whitehead, balance salary, inspector, March, warrant 965.....	37 50
31.	R. H. Gaines, salary, chemist, March, warrant 967.....	125 00
	G. de Chalmot, salary, assistant chemist, March, warrant 968..	100 00
	H. G. Buchanan, salary, clerk, March, warrant 969.....	30 00
	H. L. Jobson, salary, messenger, March, warrant 970.....	10 00
	William Baker, salary, porter, March, warrant 971.....	12 50
	H. L. Jobson, salary, messenger, March, warrant 972.....	15 00
	William Baker, salary, porter, March, warrant 973.....	12 50
April 12.	I. P. Whitehead, part salary, inspector, April, warrant 988.....	35 00
30.	R. H. Gaines, salary, chemist, April, warrant 992.....	125 00

1894.			
April 20.	To G. de Chalmot, salary, assistant chemist, April, warrant 993.....	\$100 00	
	I. P. Whitehead, balance salary, inspector, April, warrant 994.....	40 00	
	H. G. Buchanan, salary, clerk, April, warrant 995.....	30 00	
	H. L. Jobson, salary, messenger, April, warrant 996.....	10 00	
	William Baker, salary, porter, April, warrant 997.....	12 50	
	H. L. Jobson, salary, messenger, April, warrant 998.....	15 00	
	William Baker, salary, porter, April, warrant 999.....	12 50	
May, 11.	I. P. Whitehead, part salary, May, warrant 1,016.....	25 00	
31.	R. H. Gaines, salary, chemist, May, warrant 1020.....	125 00	
	G. de Chalmot, salary, assistant chemist, May, warrant 1,021...	100 00	
	I. P. Whitehead, balance salary, inspector, May, warrant 1,022..	50 00	
	H. G. Buchanan, salary, clerk, May, warrant 1,023.....	30 00	
	H. L. Jobson, salary, messenger, May, warrant 1,024.....	10 00	
	William Baker, salary, porter, May, warrant 1,025.....	12 50	
	H. L. Jobson, salary, messenger, May, warrant 1,026.....	15 00	
	William Baker, salary, porter, May, warrant 1,027.....	12 50	
June 14.	I. P. Whitehead, part salary, inspector, June, warrant 1,037.....	25 00	
30.	R. H. Gaines, salary, chemist, June, warrant 1,039.....	125 00	
	G. de Chalmot, salary, assistant chemist, June, warrant 1,040...	100 00	
	I. P. Whitehead, balance salary, inspector, June, warrant 1,041.....	50 00	
	H. G. Buchanan, salary, clerk, June, warrant 1,042.....	30 00	
	H. L. Jobson, salary, messenger, June, warrant 1,043.....	10 00	
	William Baker, salary, porter, June, warrant 1,044.....	12 50	
	H. L. Jobson, salary, messenger, June, warrant 1,045.....	15 00	
	William Baker, salary, porter, June, warrant 1,046.....	12 50	
July 31.	R. H. Gaines, salary, chemist, July, warrant 1,056.....	125 00	
	G. de Chalmot, salary, assistant chemist, July, warrant 1,057...	100 00	
	I. P. Whitehead, salary, inspector, July, warrant 1,058.....	75 00	
	H. G. Buchanan, salary, clerk, July, warrant 1,059.....	30 00	
	H. L. Jobson, salary, messenger, July, warrant 1,060.....	10 00	
	William Baker, salary, porter, July, warrant 1,061.....	12 50	
	H. L. Jobson, salary, messenger, July, warrant 1,062.....	15 00	
	William Baker, salary, porter, July, warrant 1,063.....	12 50	
Aug. 31.	R. H. Gaines, salary, chemist, August, warrant 1,074.....	125 00	
	G. de Chalmot, salary, assistant chemist, August, warrant 1,075.....	100 00	
	I. P. Whitehead, salary, inspector, August, warrant 1,076.....	75 00	
	H. G. Buchanan, salary, clerk, August, warrant 1,077.....	30 00	
	H. L. Jobson, salary, messenger, August, warrant 1,078.....	10 00	
	William Baker, salary, porter, August, warrant 1,079.....	12 50	
	H. L. Jobson, salary, messenger, August, warrant 1,080.....	15 00	
	William Baker, salary, porter, August, warrant 1,081.....	12 50	
Sept. 29.	R. H. Gaines, salary, chemist, September, warrant 1,087.....	125 00	
	G. de Chalmot, salary, assistant chemist, September, warrant 1,088.....	100 00	
	I. P. Whitehead, salary, inspector, September, warrant 1,089...	75 00	
	H. G. Buchanan, salary, clerk, September, warrant 1,090.....	30 00	
	H. L. Jobson, salary, messenger, September, warrant 1,091.....	10 00	
	William Baker, salary, porter, September, warrant 1,092.....	12 50	
	H. L. Jobson, salary, messenger, September, warrant 1,093.....	15 00	
	William Baker, salary, porter, September, warrant 1,094.....	12 50	
			\$2,760 00

EXPENSES BOARD OF AGRICULTURE.

1893.			
Oct'r 26.	R. L. Henley, expenses, president, two official trips to Richmond, warrant 901.....	13 80	
Nov'r 1.	R. M. Mallory, October meeting, warrant 905.....	31 00	
2.	R. V. Gaines, October meeting, warrant 906.....	14 25	

1893.			
Nov'r	2.	To H. L. Lyman, October meeting, warrant 907.....	\$13 82
		Orris A. Browne, April, September and October meetings of the Board, warrant 908.....	60 00
	8.	S. W. Corbin, October meeting, warrant 910.....	12 35
Dec'r	1.	Geo. W. Palmer, October meeting, warrant 918.....	33 50
	16.	R. V. Gaines, committee meeting, warrant 926.....	12 00
	23.	John L. Hurt, October meeting, warrant 929.....	9 50
1894.			
Jan'y	4.	R. M. Mallory, January meeting, Norfolk, warrant 932.....	20 50
		A. Koiner, January meeting, Norfolk, warrant 933.....	16 80
		R. V. Gaines, January meeting, Norfolk, warrant 934.....	15 00
		H. L. Lyman, January meeting, Norfolk, warrant 935.....	14 86
		Atlantic Hotel, hotel bill, seven members of Board and three attaches, January meeting, Norfolk, warrant 936.....	58 25
	6.	Thomas Whitehead, January meeting, Norfolk, warrant 937....	5 00
		H. G. Buchanan, clerk, January meeting, Norfolk, warrant 938..	5 00
		John L. Hurt, January meeting, Norfolk, warrant 939.....	20 40
	9.	S. W. Corbin, January meeting, Norfolk, warrant 942.....	13 75
	10.	E. and B. Hotel, hotel bill, commissioner, clerk and inspector, September and October meetings, warrant 943.....	14 00
	31.	H. L. Lyman, committee meeting, warrant 949.....	14 16
M'ch	22.	R. M. Mallory, called meeting, March, warrant 960.....	21 50
		A. Koiner, called meeting, March, warrant 961.....	10 70
		R. V. Gaines, called meeting, March, warrant 962.....	8 75
		R. L. Henley, called meetings, March, and January meeting Norfolk, warrant 963.....	10 30
		John L. Hurt, called meeting, March, warrant 964.....	17 00
	24.	H. L. Lyman, called meeting, March, warrant 966.....	12 76
April	3.	S. W. Corbin, called meeting, March, warrant 974.....	8 75
	18.	E. and B. Hotel, hotel bill, commissioner and clerk, called meeting, March, warrant 990.....	4 00
May	4.	R. M. Mallory, meeting, May, Lynchburg, warrant 1,070.....	30 00
		Cancelled, warrant 1,001.....	.....
		R. V. Gaines, meeting, May, Lynchburg, warrant 1,002.....	9 65
		R. L. Henley, meeting, May, Lynchburg, warrant 1,003	18 35
		Thomas Whitehead, meeting, May, Lynchburg, warrant 1,004..	7 70
		Proprietor Carrol Hotel, hotel bill, seven members and clerk, meeting, May, Lynchburg, warrant 1,005.....	24 00
		H. G. Buchanan. clerk, meeting, May, Lynchburg, warrant 1,006.....	9 85
	8.	A. J. McMath, meeting, May, Lynchburg, warrant 1,008.....	32 25
		J. K. McCann, meeting, May, Lynchburg, warrant 1,017.....	21 40
		S. W. Corbin, meeting, May, Lynchburg, warrant 1,018.....	17 00
Aug.	21.	John L. Hurt, meeting, May, Lynchburg, warrant 1,072.....	3 00
Sept.	29.	John L. Hurt, meeting, September, warrant 1,075.....	19 30
		J. K. McCann, meeting, September, warrant 1,096.....	24 50
		R. V. Gaines, meeting, September, warrant 1,098.....	12 25
		A. J. McMath, meeting, September, warrant 1,099.....	16 25

\$737 20

PUBLICATIONS.

1893.			
Oct'r	2.	Southern Planter Pub. Co., 750 copies Planter for September and October, warrant 894.....	100 00
	20.	Bradstreet Co., subscription to October, 1894, warrant 898.....	5 00
Nov'r	8.	Southern Planter Pub. Co., 750 copies of Planter for Novem- ber, warrant 909.....	50 00
Dec'r	4.	Southern Planter Pub. Co., 750 copies of Planter for Decem- ber, warrant 922	50 00
1894.			
Jan'y	2.	E. Waddey Co., 4,500 copies report of 1893, warrant 931	748 00

1894.

Jan'y 16.	To Southern Planter Pub. Co., 750 copies of Planter for January, warrant 946.....	350 00	
June 30.	J. H. Chataigne, City Directory 1894, warrant 1,048.....	5 00	1,008 00

PRINTING AND STATIONERY.

1893.

Oct'r 4.	J. W. Randolph, to binding and stationery, warrant 896.....	14 65	
9.	Everett Waddey Co., printing and stationery, warrant 897.....	25 85	
Nov'r 15.	" " " " " 913.....	15 98	
Dec'r 16.	" " " " " 925.....	12 10	

1894.

Jan'y 12.	" " " " " 944.....	3 45	
Feb'y 7.	" " " " " 951.....	14 65	
M'ch 14.	" " " " " 958.....	6 90	
April 3.	" 2,000 copies Va. Handbook, " 975.....	650 00	
6.	" printing and stationery, " 979.....	82 45	
	" " " " " 982.....	29 45	
May 8.	" " " " " 1,011.....	30 00	
	" " " " " 1,012.....	58 93	
June 6.	" " " " " 1,030.....	10 88	
	" " " " " 1,031.....	82 70	
July 9.	" " " " " 1,052.....	6 48	
	" " " " " 1,053.....	107 25	
Aug. 14.	" " " " " 1,068.....	41 00	
	" " " " " 1,069.....	82 35	
Sept. 13.	" " " " " 1,084.....	25 25	
	" " " " " 1,085.....	6 15	1,306 47

RENT.

1893.

Oct'or 4.	S. S. Cottrell, rent quarter ending Sept. 30, 1893, warrant 895....	175 00	
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1894.

Jan'y 8.	" " " " Dec. 31, 1893, " 940....	175 00	
April 3.	" " " " M'ch 31, 1894, " 976....	175 00	
	" " " " " 977....	75 00	
July 7.	" " " " June 30, 1894, " 1,050....	175 00	
	" " " " " 1,051....	75 00	850 00

INCIDENTALS.

1893.

Oct'r 31.	James Hayes, plumbing, warrant 904.....	4 50	
Nov'r 8.	R. Bosserman, storage of handbooks, Chicago, warrant 911.....	3 36	
18.	Duke & Jobson, repairs, warrant 915.....	4 25	
Dec'r 2.	Telephone Exchange, telephone one year to December 1, 1894, warrant 919.....	60 00	
4.	James Hayes, repairs to basin, warrant 921.....	3 50	
16.	James W. Martin, one dozen office chairs, warrant 924.....	9 00	

1894.

Jan'y 12.	W. A. Taliaferro, one map for office, warrant 945.....	5 00	
Feb'y 19.	James Hayes, repairs to clerk's office, warrant 952.....	3 00	
M'ch 5.	H. L. Lyman, freight charges on handbook to Chicago, warrant 956.....	11 05	
June 20.	R. H. Gaines, contingent expenses in laboratory, warrant 1,038,	14 80	
Aug. 11.	James Hayes, repairs in laboratory, warrant 1,066.....	5 00	
24.	Pleasants & Crenshaw, insurance to August 24, 1895, warrant 1,073.....	34 00	
Sept. 29.	James Hayes, repairs, warrant 1,097.....	4 50	161 96

WEATHER SERVICE.

1893.							
Oct'r 20.	To Lynn Printing Company, 300 August reports, warrant 899.....						\$20 00
Nov'r 15.	" " " " Sept. " " 912.....						20 00
Dec'r 4.	" " " " Oct. " " 920.....						20 00
1894.							
Jan'y 2.	" " " " Nov. " " 930.....						20 00
Feb'y 20.	" " " " Dec. " " 953.....						20 00
M'ch 16.	" " " " Jan. " " 959.....						20 00
April 12.	J. P. Bell " " Feb. " " 989.....						20 00
May 8.	" " " " March " " 1,009.....						20 00
June 14.	" " " " April " " 1,036.....						20 00
July 2.	" " " " May " " 1,049.....						20 00
Aug. 16.	" " " " June " " 1,070.....						20 00
Sept. 13.	" " " " July " " 1,083.....						20 00
29.	J. N. Ryker, amount paid on monthly reports, warrant 1,100....						6 00
							<hr/>
							246 00

POSTAGE.

1893.							
Oct'r 20.	Richmond postmaster, warrant 900.....						25 00
Nov'r 16.	" " " " 914						25 00
Dec'r 16.	" " " " 923.....						50 00
1894.							
Jan'y 8.	" " " " 941.....						50 00
Feb'y 3.	" " " " 950.....						50 00
M'ch 7.	" " " " 957.....						50 00
April 6.	" " " " 981.....						25 00
	" " " " 983						25 00
May 16.	" " " " 1,019.....						25 00
31.	" " " " 1,029.....						25 00
June 30.	" " " " 1,047.....						25 00
July 13.	" " " " 1,054.....						25 00
31.	" " " " 1,064.....						25 00
Aug. 6.	" " " " 1,065.....						25 00
							<hr/>
							450 00

APPROPRIATIONS BY BOARD.

1894.							
April 23.	H. L. Lyman, chairman Horticultural Committee, expense of eradicating San Jose Scale in county of Albemarle, warrant 991.....						16 70
							<hr/>
							16 70

LABORATORY.

1894.							
April 3.	Elmer & Amend, chemicals, warrant 978.....						65 37
6.	Powers-Taylor Drug Co., chemicals, warrant 980.....						14 40
May 8.	Elmer & Amend, chemicals, warrant 1,013						80 44
June 6.	Powers-Taylor Drug Co., chemicals, warrant 1,032.....						35 60
9.	Elmer & Amend, chemicals, warrant 1,034						72 76
Aug. 14.	Powers-Taylor Drug Co., chemicals, warrant 1,069						15 84
							<hr/>
							284 31

EXPENSES OF INSPECTION.

1894.							
April 10.	Thomas J. Stratton, expenses of sampler, warrant 984.....						32 29
	" salary one month, " 985.....						50 00
	John Cartwright, expenses of sampler, " 986.....						67 12
	" salary one month, " 987.....						50 00
May 7.	I. P. Whitehead, expenses of inspector, " 1,007.....						9 10

1894.			
May	8.	To A. Jeffers, rent of office for sampler four months at \$5, warrant 1,010.....	\$20 00
		John Cartwright, expenses and salary of sampler one month, warrant 1,014.....	99 31
		Thomas J. Stratton, expenses and salary of sampler one month, warrant 1,015.....	165 90
	31.	Thomas J. Stratton, 1,000-mile tickets, N. & W. and R. & D., warrant 1,028.....	50 00
June	6.	Thomas J. Stratton, expenses and salary one month, warrant 1,033.....	117 50
		E. B. Taylor Co., two gross sample jars, warrant 1,035.....	12 00
July	16.	I. P. Whitehead, expenses of inspector, warrant 1,055.....	3 00
Aug.	16.	Thomas J. Stratton, 1,000-mile ticket, Southern railway, warrant 1,071.....	25 00
Sept.	5.	I. P. Whitehead, expenses of inspector, warrant 1,082.....	10 20
	18.	“ “ “ “ 1,086.....	2 75

714 17

FERTILIZER FUND.

SALARIES OF EMPLOYEES.

1893.		
Oct'r 11.	I. P. Whitehead, part salary, inspector, October, warrant 411...	25 00
27.	H. L. Jobson, salary, messenger, October, warrant 416.....	10 00
31.	R. H. Gaines, salary, chemist, October, warrant 417.....	125 00
	G. de Chalmot, salary, assistant chemist, October, warrant 418,	100 00
	I. P. Whitehead, balance salary, inspector, October, warrant 419.....	50 00
	H. G. Buchanan, salary, clerk, October, warrant 420.....	30 00
	Wm. Baker, salary, porter, October, warrant 421.....	12 50
Nov'r 11.	I. P. Whitehead, part salary, inspector, November, warrant 423,	30 00
29.	R. H. Gaines, salary, chemist, November, warrant 425.....	125 00
	G. de Chalmot, salary, as-istant chemist, November, warrant 426.....	100 00
	I. P. Whitehead, balance salary, inspector, November, warrant 427.....	45 00
	H. G. Buchanan, salary, clerk, November, warrant 428.....	30 00
	H. L. Jobson, salary, messenger, November, warrant 429.....	10 00
	Wm. Baker, salary, porter, November, warrant 430.....	12 50
Dec'r 23.	R. H. Gaines, salary, chemist, December, warrant 431.....	125 00
	G. de Chalmot, salary, assistant chemist, December, warrant 432.....	100 00
	I. P. Whitehead, salary, inspector, December, warrant 433.....	75 00
	H. G. Buchanan, salary, clerk, December, warrant 434.....	30 00
	H. L. Jobson, salary, messenger, December, warrant 435.....	10 00
	Wm. Baker, salary, porter, December, warrant 436.....	12 50
1894.		
Jan'y 11.	Warrant 443 cancelled.	
17.	I. P. Whitehead, part salary, inspector, January, warrant 445...	40 00
31.	I. P. Whitehead, balance salary, inspector, January, warrant 447.....	35 00
	R. H. Gaines, salary, chemist, January, warrant 448.....	125 00
	G. de Chalmot, salary, assistant chemist, January, warrant 449,	100 00
	H. G. Buchanan, salary, clerk, January, warrant 450.....	30 00
	H. L. Jobson, salary, messenger, January, warrant 451.....	10 00
	Wm. Baker, salary, porter, January, warrant 452.....	12 50
Feb'y 23.	R. H. Gaines, salary, chemist, February, warrant 463.....	125 00
	G. de Chalmot, salary, assistant chemist, February, warrant 464.....	100 00
	I. P. Whitehead, salary, inspector, February, warrant 465.....	75 00
	H. G. Buchanan, salary, clerk, February, warrant 466.....	30 00

1894.			
Feb'y 28.	To H. L. Jobson, salary, messenger, February, warrant 467.....	\$10 00	
	Wm. Baker, salary, porter, February, warrant 468.....	12 50	
M'ch 13.	I. P. Whitehead, part salary, inspector, March, warrant 473....	37 50	1,800 00

LABORATORY.

1893.			
Oct'r 6.	Powers-Taylor Drug Co., chemicals, warrant 409.....	10 40	
Nov'r 10.	" " " " 422.....	22 51	
1894.			
Feb'y 1.	Elmer & Amend, " " 454.....	219 31	
23.	" " " " 462.....	132 87	
M'ch 7.	Powers-Taylor Drug Co., " " 471.....	19 94	405 03

EXPENSES OF INSPECTION.

1893.			
Oct'r 11.	I. P. Whitehead, expenses of inspector, warrant 412.....	6 50	
17.	Thomas J. Stratton, expenses of sampler, warrant 413.....	70 77	
	Thomas J. Stratton, salary of sampler for 1½ months at \$50 per month, warrant 414.....	75 00	
25.	I. P. Whitehead, expenses of inspector, warrant 415.....	4 75	
1894.			
Jan'y 4.	" 1,000-mile ticket, C. & O., warrant 439.....	25 00	
	" " N. & W., " 440.....	25 00	
23.	" contingent expenses, inspector, warrant 446..	10 00	
Feb'y 7.	Thomas J. Stratton, salary sampler one month, " 456..	50 00	
12.	" expenses sampler, " 457..	44 40	
	I. P. Whitehead, expenses inspector, " 459..	5 60	
M'ch 14.	Thomas J. Stratton, expenses sampler, " 475..	91 23	
16.	" salary sampler one month, " 476..	50 00	458 25

PRINTING AND STATIONERY.

1893.			
Oct'r 9.	Everett Waddey Co., printing and stationery, warrant 410.....	11 55	
Nov'r 15.	" " " " " 424.....	31 25	
1894.			
Jan'y 12.	" " " " " 444.....	26 55	
Feb'y 7.	" " " " " 455.....	20 70	90 05

INCIDENTALS.

1894.			
Jan'y 2.	R. H. Gaines, contingent expenses in laboratory, warrant 438..	3 01	
9.	" expenses chemist attending the board meeting in Norfolk, warrant 442.....	5 00	
Feb'y 1.	Duke & Jobson for three sample boxes, warrant 453.....	9 00	
M'ch 2.	" for one stand for laboratory, warrant 469.....	3 00	
8.	James Hayes, repairs in the laboratory, warrant 472.....	5 50	25 51

RENT.

1893.			
Oct'r 4.	S. S. Cottrell, rent quarter ending Sept. 30, 1893, warrant 408...	75 00	
1894.			
Jan'y 8.	" " " " Dec. 31, 1893, " 441.....	75 00	150 00

POSTAGE.

1893.			
Oct'r 4.	Richmond postmaster, stamps, warrant 407.....	20 00	
Dec'r 23.	" " " " 437.....	50 00	
1894.			
Feb'y 20.	To Richmond postmaster, stamps, warrant 461.....	25 00	95 00

PERIODICALS.

1894.

Feb'y 12.	To B. F. Stevens, for scientific periodicals, warrant 458.....	\$16 43	
M'rch 3.	J. W. Randolph & Co., books for library, warrant 470.....	41 50	
			57 93

BOARD OF AGRICULTURE.

1894.

Feb'y 19.	Orris A. Brown, attending meeting of chemical committee of Board, warrant 460.....	24 25	
			24 25

SUMMARY.

GENERAL FUND.

Salaries of employees.....	2,760 00	
Expenses of board of agriculture.....	737 20	
Publications.....	1,008 00	
Printing and stationery.....	1,306 47	
Rent.....	850 00	
Incidentals.....	161 96	
Weather service.....	246 00	
Postage.....	450 00	
Appropriations by board.....	16 70	
Laboratory.....	284 31	
Expenses of inspection.....	714 17	
Farmers' institutes.....	75 00	
		8,609 81

FERTILIZER FUND.

Salaries.....	1,800 00	
Laboratory.....	405 03	
Expense of inspection.....	458 25	
Printing and Stationary.....	90 05	
Incidentals.....	25 51	
Rent.....	150 00	
Postage.....	95 00	
Periodicals.....	57 93	
Board of Agriculture.....	24 25	
		3,106 02

Total expenditures fiscal year 1893-'94..... \$11,715 83

Appropriation for general agricultural purposes.....	10,000 00
Amount received from fertilizer fees.....	9,180 00

Total receipts..... 19,180 00

Total expenditures fiscal year 1893-'94.....	11,715 83
Lapsed into treasury.....	7,464 17

\$19,180 00

CROP REPORT.

JULY, 1894.

While the State of Virginia is divided by geologists into Tide-water, Middle, Piedmont, the Valley, Blue Ridge and Appalachia, the agricultural products of the State in several of these divisions are similar, making them, as it were, run into each other.

It has been therefore thought wise for convenience and clearness to divide the State into three agricultural sections, as follows: Tidewater, Middle, including Piedmont and the Blue Ridge, and the Great Valley, including Appalachia.

The productions of Appalachia differ from the Valley west of the Blue Ridge only in neighborhoods, and those in Piedmont and the Blue Ridge from those in Middle in much the same way.

For instance, many valleys in Appalachia are of the purest limestone, and a large part of it devoted to grazing, like the Valley, and to the production of crops similar to that section; and the Blue Ridge and Piedmont are highly adapted to the cultivation of fruits and grasses, and tobacco, as in Middle Virginia, is produced successfully, and brings into the counties a considerable amount of money.

Hence, from our division, we can say that the most prominent stock, hay and pasture section is the Great Valley of Virginia; the great fruit and tobacco region is Middle Virginia, and the great vegetable and trucking country is Tidewater.

NOTES.

The past season cannot be said to have been, on the whole, favorable to the agriculture of the State. As reported by the State weather service:

"Up to the 24th of March the weather and temperature conditions had been very favorable for the rapid advancement of all preparations for spring sowing and planting. During the week ending March 24th the temperature was abnormally high over the entire section, and higher than ever recorded during March since the Weather Bureau records began, in 1870. This had the effect of bringing all the early fruit into bloom; winter wheat and clover grew up rankly, and new clover came up. This warm spell was immediately followed by a very severe and protracted cold snap, with a cold wave, which extended over the country east of the Rocky Mountains, and caused freezing temperatures and killing frosts as far southward as central Texas and the Gulf coast. In this State the early fruits were generally all killed, and probably the greater portion of the late apple crop; clover was cut down and new clover largely killed; wheat was injured and set back, and

where it had begun to joint was killed ; the strawberry bloom was generally killed ; tobacco plants were injured or killed where not properly protected."

A good deal of truck was destroyed, and replanting was rendered necessary. The trucks not killed were retarded considerably.

This killing frost of March was followed by a good deal of cold and unfavorable weather in April, and the crops that had been injured and retarded by the frosts of March had little opportunity to recuperate during the month of April.

Hence, as will be seen from the appended tables, the general average of crops for this year will be below that for 1893.

Apples, peaches and pears are a failure throughout the entire State; the grape crop is much better, and will be a fair yield.

ACREAGE OF CROPS.

By reference to the tables it will be seen that the acreage of wheat, tobacco and peanuts is below that of last year.

The low price of tobacco directly affected the acreage, and if this reduction of acreage is found among those who are not regular and experienced planters, the injury will not be serious, as the average crop may be better.

In addition to this, the frost in the spring affecting the wheat and hay, and the drought in many sections affecting the planting of tobacco and sweet potatoes, in reality reduces the acreage.

In many sections this has been a bad year for securing a good stand of any crop.

The acreage of corn, oats, hay, and Irish potatoes is about the same as last year.

For cotton, corn, and sweet potatoes the acreage is higher than last year, and the prospect better for cotton.

PROSPECT OF CROPS.

The crops of wheat, oats, and hay are undoubtedly short. The farmers will do well to supplement their forage crops with turnips, millet, peas, and late corn. With a wet August the grass crop of Tidewater will aid in this matter.

The prospect for corn is below the general average of that crop for last year, but the prospect in Middle Virginia is so much better than last year that it nearly brings up the falling off in the Valley and Tidewater to the general average for 1893.

The prospect for tobacco last year was 93 ; this year the average for the State is 79.

Cotton, with a prospect of 86, is three points higher than that for last year.

Irish potatoes are reported to be a much better crop than last year, while sweet potatoes, with a prospect of 88, are two points below that of last year.

Peanuts have a prospect of 83 this year, against 92 for 1893.

The cool, wet weather of the early spring retarded and injured the pastures until the prospect this year is recorded at 85, against 92 for the past year.

COUNTIES.	PROSPECT.												
	Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanutg.	Pastures.	Apples.	Peaches.	Pears.
Accomac.....	100	97	92				103	112		100	17	15	42
Caroline.....	100	75	55	37		75	100	100		42	35	00	5
Charles City.....	90	89	86	69			92	95		70	30	10	08
Elizabeth City.													
Essex.....	52	95	55	52			95	100	100	82	20	5	5
Gloucester.....	87	85	67	75			72	92		72	15	00	00
Hanover.....	85	88	88	70		82	98	96		100	00	00	00
Henrico.....	80	100	85	90			105	100		115	00	00	00
Isle of Wight.													
James City.....		70	40	40			90	80			00	00	00
King George.....	94	90	79	74			96	90		88	42	10	15
King and Queen.....	87	87	97	67			95	90	95	85	10	5	5
King William.....	95	85	77	62		90	95	80		92	10	5	00
Lancaster.....	92	97	85	75			93	93		75	12	5	10
Mathews.....	95	92	77	95			87	100		95	17	5	20
Middlesex.....	91	91	87	82			97	97		91	28	00	7
Nansemond.....	82	100	55	75	90		80	100	90	90	50	45	45
New Kent.....	89	95	75	63			97	94		90	12	5	05
Northumberland..	90	100	30	90			100	80			25	00	00
Norfolk.....	107	75	74	63			87	93		90	20	5	5
Northampton.....	100	70	100				50	100		100	01	1	1
Princess Anne.													
Prince George.....	92	92	87	81	95		67	96	86	86	40	00	2
Richmond.....	88	82	100	75			82	90		70	17	2	15
Southampton.....	100	60	95	70			65	100	88	100	10	00	00
Surry.....		80	55	62			70	97	90	62	15	00	00
Sussex.....	87	100	50	55	100		88	95	95	88	10	00	00
Warwick.....		97	68	75			82	93	83	67	17	13	17
Westmoreland.....	87	85	75	63			85	93		65	47	5	62
York.....	95	100	85	90			75	100	90	100	50	25	25
Average.....	88	92	72	73	84	82	86	95	91	85	20	6	11
Average 1893.....	96	99	92	73	85	98	75	91	93	91	81	75	79

WATER.

ACREAGE.

Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.	Pastures.
.....	100	88	107	.....	.....	107	107	.....	105
65	100	120	100	.....	62	112	112	.....	112
83	105	91	95	.....	.....	105	100	.....	100
40	100	87	87	.....	.....	100	100	100	87
95	100	110	100	.....	.....	115	105	.....	100
86	107	100	93	.....	77	100	100	.....	100
27	95	85	100	.....	.....	100	100	.....	200
.....	80	60	70	.....	.....	90	90	.....	.....
89	105	90	99	.....	.....	97	78	.....	103
72	95	110	80	.....	.....	117	112	90	100
55	105	82	62	.....	80	90	80	.....	100
82	103	97	100	.....	.....	105	97	.....	100
95	105	92	105	.....	.....	100	105	.....	100
91	100	100	117	.....	.....	110	104	.....	107
50	90	56	56	60	.....	95	100	75	56
77	96	93	93	86	.....	96	104	.....	93
75	110	25	100	.....	.....	110	100	.....	.....
.....	105	88	103	100	.....	103	107	.....	105
.....	100	100	100	.....	.....	110	100	.....	100
100	92	95	89	105	.....	104	102	86	97
88	95	90	62	.....	.....	90	95	.....	82
.....	105	100	100	162	.....	105	107	72	100
.....	102	97	100	.....	.....	109	102	85	100
88	110	100	100	125	.....	100	100	80	100
.....	100	100	83	.....	.....	103	103	58	100
83	103	95	85	.....	.....	108	107	.....	100
80	90	85	85	.....	.....	75	95	90	.....
76	100	90	91	106	73	102	101	82	102
95	100	94	93	75	100	98	88	83	98

COUNTIES.	PROSPECT.												
	Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.	Pastures.	Apples.	Peaches.	Pears.
Albemarle	93	100	75	57	.....	70	95	95	.....	78	60	00	31
Amherst	74	90	72	72	.....	75	87	95	.....	65	00	00	00
Alexandria	100	100	75	70	.....	.....	100	.....	.....	75	10	25	.....
Appomattox	80	93	51	45	.....	82	85	83	.....	73	40	20	20
Amelia	80	90	75	50	.....	90	.....	.....	.....	80	.....	.....	.....
Bedford	67	70	55	31	.....	65	.....	.....	.....	45	00	00	00
Buckingham	77	87	48	53	.....	71	65	96	.....	84	12	00	00
Brunswick	73	92	82	80	75	93	97	97	.....	93	10	00	00
Culpeper	90	100	25	25	.....	.....	100	75	.....	25	00	00	00
Cumberland	52	90	45	40	.....	55	50	95	.....	80	8	00	00
Chesterfield	95	95	87	80	.....	85	97	95	80	102	15	00	10
Carroll	78	80	80	55	.....	.....	82	67	.....	53	13	00	00
Campbell	53	85	45	35	.....	60	72	85	.....	55	00	00	00
Charlotte	59	87	60	42	.....	73	60	83	.....	56	17	00	00
Dinwiddle	72	97	80	70	100	97	93	100	82	80	30	00	25
Fairfax	97	95	76	74	.....	.....	100	100	.....	97	49	10	65
Floyd	65	73	68	53	.....	50	95	75	.....	67	00	00	00
Fauquier	97	82	77	51	.....	.....	92	95	.....	80	45	5	40
Franklin	66	95	51	44	.....	76	90	95	.....	77	00	00	00
Fluvanna	73	75	52	48	.....	63	85	63	.....	67	17	00	00
Greene	60	89	65	35	.....	65	92	83	.....	61	40	20	00
Goochland	70	90	60	40	.....	40	90	90	.....	95	00	00	00
Greensville	80	82	65	50	90	.....	60	80	65	90	10	00	00
Grayson	60	82	62	62	.....	.....	100	.....	.....	75	25	00	00
Halifax	50	100	47	42	.....	60	80	100	.....	60	00	00	00
Henry	76	96	76	74	.....	66	57	80	.....	85	20	10	10
Louisa	80	87	65	40	.....	78	90	92	.....	65	15	5	5
Loudoun	100	97	58	60	.....	.....	95	.....	.....	86	17	15	16
Lunenburg	67	100	70	50	.....	90	100	100	.....	80	10	00	00
Madison	82	100	47	35	.....	.....	100	100	.....	75	17	00	00

DLE.

ACREAGE.

Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.	Pastures.
80	115	100	90	.....	62	100	100	.....	100
85	97	97	85	.....	85	97	100	.....	100
80	100	75	100	.....	.....	120	.....	.....	100
95	102	93	100	.....	87	100	100	.....	100
75	100	90	100	.....	95	.....	.....	.....	95
85	100	87	90	.....	62	.....	.....	.....	100
95	100	84	98	.....	85	100	101	.....	100
95	100	100	100	100	95	100	100	.....	100
85	125	100	80	.....	.....	100	100	.....	100
75	105	80	80	.....	67	105	105	.....	110
80	105	92	92	.....	50	100	110	50	97
90	90	92	97	.....	.....	100	97	.....	100
85	97	77	80	.....	70	97	97	.....	97
76	103	92	93	.....	78	97	98	.....	98
100	100	100	97	110	100	97	95	75	97
83	100	100	97	.....	.....	107	100	.....	107
108	100	100	92	.....	67	97	88	.....	92
87	102	85	85	.....	.....	90	87	.....	100
97	105	100	90	.....	65	100	100	.....	97
83	93	87	90	.....	78	90	98	.....	93
90	102	102	97	.....	100	100	97	.....	100
65	105	100	90	.....	50	110	90	.....	100
70	100	65	.....	85	.....	75	90	65	.....
95	105	100	100	.....	60	105	95	.....	75
85	105	95	95	.....	60	95	100	.....	100
100	105	100	72	.....	65	100	87	.....	92
85	95	95	95	.....	75	92	97	.....	100
93	104	89	82	.....	.....	108	100	.....	100
85	103	93	103	.....	88	100	100	.....	100
80	100	100	100	.....	.....	100	100	.....	100

MIDDLE—

COUNTIES.	PROSPECT.													
	Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.	Pastures.	Apples.	Peaches.	Pears.	Grapes.
Mecklenburg.....	75	90	80	.....	.....	80	60	80	.....	60	00	00	00	75
Nelson.....	85	80	55	50	.....	62	77	90	.....	60	00	00	00	83
Nottoway.....	70	91	75	72	.....	85	95	98	.....	83	17	00	00	70
Orange.....	75	100	65	60	.....	.....	100	98	.....	90	00	00	00	00
Patrick.....	75	97	53	68	.....	70	93	90	.....	63	7	00	00	65
Prince William.....	103	98	81	86	.....	.....	104	95	.....	99	45	00	27	100
Powhatan.....	77	97	79	64	.....	77	97	103	.....	92	15	00	00	87
Prince Edward.....	57	87	45	42	.....	77	83	90	.....	68	20	00	00	85
Pittsylvania.....	57	92	55	52	.....	75	83	88	.....	62	15	00	00	83
Rappahannock.....	87	93	92	45	.....	.....	85	.....	.....	83	.....	10	25	00
Stafford.....	85	75	50	50	.....	75	75	75	.....	50	50	00	00	100
Spotsylvania.....	87	92	75	68	.....	.....	88	97	.....	58	00	00	00	87
Average.....	76	90	64	54	88	73	87	90	76	73	16	3	8	73
Average 1893.....	100	75	97	70	80	92	97	87	90	90	70	68	66	85

Continued.

ACREAGE.

Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.	Pastures.
60	90	70	.....	.....	70	50	70	.....	50
92	100	83	97	.....	65	100	100	.....	90
90	100	100	97	.....	82	97	100	.....	100
75	115	105	100	.....	.....	.....	98	.....	100
93	112	100	103	.....	90	103	93	.....	102
96	100	96	98	.....	.....	104	.....	.....	98
86	100	100	92	.....	82	100	101	.....	100
95	102	102	103	.....	97	100	93	.....	100
100	103	100	97	.....	70	100	93	.....	100
80	98	95	68	.....	.....	83	.....	.....	100
75	100	100	100	.....	100	100	100	.....	100
72	105	107	98	.....	.....	105	103	.....	100
86	102	94	93	98	77	98	97	63	95
91	100	91	89	82	93	97	87	76	93

THE GREAT

COUNTIES.	PROSPECT.													
	Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.	Pastures.	Apples.	Peaches.	Pears.	Grapes.
Alleghany.....	80	100	69	54			77			79	00	00	8	93
Augusta.....	72	95	70	60			87			70	17	5	5	70
Bath.....	92	80	77	60			72			85	15	00	00	47
Bland.....	75	73	52	55			97	72		62	18	5	10	65
Buchanan.														
Botetourt.....	84	88	54	53			94	84		68	5	00	00	88
Clarke.....	97	91	95	94			103			107	72	29	37	83
Craig.....	75	88	50	45			85			65	10	5	6	38
Dickenson.....	85	95	50	70			100	75		85	30	15	15	70
Frederick.....	100	100	90	60			100	100		100	30	10	10	100
Giles.														
Highland.....	85	72	50	80			85			90	32	52	47	27
Lee.....	82	77	73	85			83	47		77	5	00	00	45
Montgomery.....	90	80	50	40			80			70	00	00	00	25
Pulaski.....	70	70	40	25			62			57	5	00	5	75
Page.....	85	95	60	50			96	92		74	3	00	1	70
Russell.....	77	86	60	59		100	97	60		86	10	53	00	53
Rockbridge.....	79	88	63	52			90	80		86	11	00	00	75
Rockingham.....	55	100	47	55			87			50	00	00	5	50
Roanoke.....	77	100	40	37			105	100		77	5	5	5	50
Shenandoah.....	82	98	62	72			88	100		78	18	00	5	109
Smyth.....	80	96	71	70			99	52		81	34	7	12	79
Scott.....	97	97	70	80		78	102	81		82	10	00	00	53
Tazewell.....	86	82	71	74			100			81	12	1	12	55
Washington.....	93	88	82	53		67	90	80		87	00	00	20	25
Wise.....	72	82	63	83		82	92	52		80	20	00	00	57
Warren.....	95	90	63	72			100	100		83	12	15	13	88
Wythe.....	77	84	69	36			90			53	10	10	10	82
Average.....	82	88	63	61		82	91	78		77	15	6	9	65
Average 1893.....	104	96	96	81		89	97	92		97	59	45	57	82

VALLEY.

ACREAGE.

Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.	Pastures.
101	127	101	91	.....	.....	119	.....	.....	100
100	92	85	98	.....	.....	87	.....	.....	100
80	105	105	97	.....	.....	112	.....	.....	100
100	97	97	100	.....	.....	100	93	.....	100
91	98	93	98	.....	.....	100	72	.....	100
98	101	95	91	.....	.....	108	.....	.....	97
88	100	100	90	.....	.....	100	100	.....	100
100	100	100	100	.....	.....	110	100	.....	101
100	110	100	100	.....	.....	100	100	.....	100
105	110	110	100	.....	.....	105	.....	.....	95
88	103	100	93	.....	.....	98	97	.....	100
95	107	100	105	.....	.....	115	.....	.....	100
95	107	95	105	.....	.....	125	.....	.....	95
96	104	83	85	.....	.....	103	96	.....	85
97	107	65	82	.....	100	97	72	.....	95
83	92	87	80	.....	.....	104	87	.....	96
105	100	87	75	.....	.....	100	.....	.....	100
100	110	115	100	.....	.....	110	105	.....	95
95	100	100	82	.....	.....	103	100	.....	103
98	102	88	99	.....	.....	127	95	.....	96
79	86	79	77	.....	100	83	83	.....	73
84	94	82	76	.....	.....	98	.....	.....	93
100	100	90	100	.....	75	117	88	.....	100
58	113	110	97	.....	30	117	85	.....	65
100	101	103	95	.....	.....	100	100	.....	97
98	102	93	90	.....	.....	112	.....	.....	100
94	103	94	93	.....	81	106	92	.....	96
97	103	94	91	.....	92	106	87	.....	97

GENERAL AVERAGE OF CROPS FOR STATE FOR 1894.

PROSPECT.—Wheat, 82; Corn, 90; Oats, 66; Hay, 63; Cotton, 86; Tobacco, 79; Irish Potatoes, 88; Sweet Potatoes, 88; Peanuts, 83; Pastures, 85; Apples, 17; Peaches, 5; Pears, 9; Grapes, 74.

ACREAGE.—Wheat, 85; Corn, 102; Oats, 93; Hay, 92; Cotton, 102; Tobacco, 77; Irish Potatoes, 102; Sweet Potatoes, 97; Peanuts, 72; Pastures, 98.

GENERAL AVERAGE OF CROPS FOR STATE FOR 1893.

PROSPECT.—Wheat, 100; Corn, 97; Oats, 95; Hay, 75; Cotton, 83; Tobacco, 93; Irish Potatoes, 46; Sweet Potatoes, 90; Peanuts, 92; Pastures, 93; Apples, 70; Peaches, 63; Pears, 67; Grapes, 86.

ACREAGE.—Wheat, 94; Corn, 101; Oats, 93; Hay, 92; Cotton, 79; Tobacco, 95; Irish Potatoes, 100; Sweet Potatoes, 87; Peanuts, 80; Pastures, 97.

EXPLANATORY.

In Virginia no provision has been made by law for the collection of accurate statistics of agricultural productions. In order to aid those interested in crop statistics, in understanding our average and prospect tables, the following explanation is made, based on the census report of 1880:

TIDEWATER.

Twenty counties in this section report on the production of wheat, twenty-seven report corn, and three tobacco.

Hanover is the largest wheat-producing county in this section, producing over 100,000 bushels. Accomac leads in the production of corn, the number of bushels produced being given at 500,000.

Of the three counties producing tobacco in this section, Hanover leads, producing over 1,000,000 pounds, followed by Caroline over 900,000, and King William 63,000.

MIDDLE.

Reports have been received from every county in Middle Virginia. Loudoun leads in the production of wheat, producing over 500,000 bushels. The above county also leads in corn, producing 1,000,000 bushels.

Pittsylvania leads this section in the production of tobacco, producing over 12,000,000 pounds, followed by Halifax, with over 7,000,000; Bedford with over 5,000,000; Campbell with about 4,000,000; Amherst, Charlotte, Franklin, Henry, and Mecklenburg with over 3,000,000; Nelson, Prince Edward, and Albemarle with over 2,000,000, and Amelia, Appomattox, Brunswick, Cumberland, Dinwiddie, Louisa, Lunenburg, and Nottoway producing from 1,000,000 to 2,000,000 pounds, down to Stafford with 4,000 pounds.

GREAT VALLEY.

In this section all but two counties report wheat and corn. Only four report on tobacco. Augusta leads in the production of wheat, raising over 500,000 bushels, and also corn, producing over 700,000 bushels, followed very closely by Rockingham.

Out of the four counties producing tobacco in this section, Washington leads, producing over 300,000 pounds; Wise closes with 3,000 pounds.

REPORT ON YIELD OF THE CROPS.

OCTOBER, 1894.

NOTE.—In the appended table 100 represents the average crop, and if there is an increase of 10 per cent. in the yield there will be recorded 110, and if decrease of 10 per cent., 90, etc.

TIDEWATER.

COUNTIES.	Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.
Accomac	90	110	90	90			100	105	
Caroline	95	85	70	70		92	75	100	
Charles City	80	100	75	70			75	62	
Elizabeth City.									
Essex.									
Gloucester	80	100	50	75			90		
Hanover	85	105	100	70		40	75	105	
Henrico	80	100	100	90			85	90	
Isle of Wight	70	102	55	60	85	95	97	100	80
James City		110	70	70			110	100	
King George	110	80	82	65			62	82	
King & Queen	91	92	80	71		95	78	99	
King William	100	90	85	70		90	110	100	
Lancaster	95	82	87	63			75	90	
Mathews	87	95	84	89			80	96	
Middlesex	90	90	100	90			85	90	
Nansemond	66	110	33	50	70		110	90	85
New Kent	90	105	82	85			92	96	62
Northumberland.									
Norfolk		100	80	70	80		50	100	
Northampton		110	62	100			70	80	
Princess Anne		110	90	110			100	100	
Prince George.									
Richmond	82	85	95	75			75	75	
Southampton		110	72	95	97		85	100	110
Surry	70	85	45	90	90	90	75	100	92
Sussex.									
Warwick		87	83	83			83	88	93
Westmoreland	94	79	71	55			85	90	
York	95	100	85	100			105	110	90
Average	85	97	77	78	84	84	85	94	87

THE GREAT VALLEY.

COUNTIES.	Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.
Alleghany.....	85	75	45	45	.....	.....	75	.....	.....
Augusta.....	66	64	44	50	.....	.....	87	.....	.....
Bath.....	95	67	53	60	.....	.....	57	.....	.....
Bland.....	100	100	100	75	.....	.....	100	.....	.....
Buchanan.									
Botetourt.....	85	92	50	58	.....	.....	85	82	.....
Clark.....	93	75	97	72	.....	.....	55	.....	.....
Craig.....	90	100	40	50	.....	.....	85	.....	.....
Dickinson.....	102	100	77	87	.....	102	95	75	.....
Frederick.....	110	100	90	90	.....	.....	100	.....	.....
Giles.....	92	110	75	58	.....	.....	70	75	.....
Highland.....	105	75	82	67	.....	.....	67	.....	.....
Lee.....	92	97	93	65	.....	.....	50	85	.....
Montgomery.....	91	81	50	37	.....	70	37	.....	.....
Pulaski.									
Page.....	72	68	57	62	.....	.....	55	55	.....
Russell.....	100	75	75	30	.....	100	75	80	.....
Rockbridge.....	77	72	70	63	.....	.....	90	70	.....
Rockingham.									
Roanoke.....	75	90	60	60	.....	85	75	.....	.....
Shenandoah.....	87	72	55	63	.....	.....	58	.....	.....
Smyth.....	88	100	72	73	.....	.....	87	.....	.....
Scott.....	95	102	67	75	.....	77	77	77	.....
Tazewell.....	90	85	87	75	.....	75	95	.....	.....
Washington.....	95	95	75	62	.....	77	87	90	.....
Wise.....	60	110	50	100	.....	.....	75	75	.....
Warren.....	96	97	63	72	.....	.....	63	68	.....
Wythe.....	72	82	75	37	.....	.....	70	60	.....
Average.....	89	87	64	63	.....	84	74	74	.....

MIDDLE VIRGINIA.

COUNTIES.	Wheat.	Corn.	Oats.	Hay.	Cotton.	Tobacco.	Irish Potatoes.	Sweet Potatoes.	Peanuts.
Albemarle.....	82	75	77	52	.....	62	52	82	
Amherst.....	77	100	60	60	.....	72	63	82	
Alexandria.....	100	60	90	60	.....	.....	75	85	
Appomattox.....	.....	.....	.....	.....	.....	.....	.....	.....
Amelia.....	72	107	65	75	.....	90	75	95	
Bedford.....	75	90	80	45	.....	85	90	.....
Buckingham.....	62	95	37	50	.....	70	62	90	
Brunswick.....	70	105	80	70	105	105	75	87	
Culpeper.....	75	80	60	80	.....	.....	.....	.....
Cumberland.....	45	100	20	45	.....	80	15	80	
Chesterfield.....	87	105	80	82	.....	97	77	90	
Carroll.....	79	71	78	55	.....	.....	78	77	
Campbell.....	55	100	25	45	.....	65	65	65	
Charlotte.....	65	122	80	55	.....	100	25	50	
Dinwiddle.....	79	99	77	78	87	101	89	97	90
Fairfax.....	98	63	70	83	.....	.....	90	.....
Floyd.....	77	67	73	63	.....	81	85	81	
Fauquier.....	104	104	77	56	.....	.....	69	.....
Franklin.....	62	92	51	45	.....	63	70	68	
Fluvanna.....	80	110	80	75	.....	90	100	100	
Greene.....	71	79	66	49	.....	80	87	94	
Goochland.....	92	102	100	65	.....	77	90	85	
Greensville.....	75	108	90	90	95	.....	90	100	85
Grayson.....	68	90	93	40	.....	.....	82	.....
Halifax.....	.....	.....	.....	.....	.....	.....	.....	.....
Henry.....	65	81	62	57	.....	55	70	45	
Louisa.....	50	87	60	55	.....	62	87	87	
Loudoun.....	111	74	64	66	.....	.....	57	.....
Lunenburg.....	62	102	70	60	.....	100	90	100	
Madison.....	80	90	75	50	.....	.....	50	100	
Mecklenburg.....	90	100	90	80	.....	100	80	100	
Nelson.....	65	79	48	29	.....	62	74	79	
Nottoway.....	67	115	70	75	.....	105	75	100	
Orange.....	67	77	90	40	.....	.....	75	90	
Patrick.....	73	67	63	68	.....	.....	80	53	
Prince William.....	103	92	78	78	.....	.....	80	.....
Powhatan.....	62	107	85	50	.....	95	77	82	
Prince Edward.....	50	100	50	50	.....	90	40	80	
Pittsylvania.....	50	90	60	60	.....	90	60	60	
Rappahannock.....	95	75	71	50	.....	90	75	50	
Stafford.....	90	62	82	57	.....	80	55	57	
Spotsylvania.....	78	90	70	53	.....	87	65	100	
Average.....	75	90	70	60	96	82	70	81	87

GENERAL AVERAGE YIELD FOR THE STATE.

1893.

Wheat, 96; corn, 83; oats, 96; hay, 70; cotton, 86; tobacco, 86, Irish potatoes, 90; sweet potatoes, 89; peanuts, 86.

1894.

Wheat, 83; corn, 91; oats, 70; hay, 67; cotton, 90; tobacco, 83; Irish potatoes, 76; sweet potatoes, 83; peanuts, 87.

NOTES.

The yield of crops this year for the State, taking them altogether, is not up to the average of last year.

Corn, cotton and peanuts are the only crops this year that are given a higher per cent of yield over those of 1893. The per cents being corn, 91, cotton, 90, and peanuts, 87, as against corn, 83, cotton, 86, and peanuts, 86, for 1893.

The July crop report gave the general average prospect for wheat for the entire State at 82; the average yield is 83. The prospect for corn was 90; the returns give the yield at 91. The prospect for oats in July was 66, and the general average yield as reported in October is 70.

The hay crop has been a short one for the last three years. The prospect in July, 1894, was put at 63, the yield returned in October was 67.

The yield of cotton this year is 87 compared with 86 last year.

The yield of tobacco is somewhat of an improvement over the prospect given in July, the prospect being put at 79, while the yield averages for the State 83.

The yield of Irish potatoes is below that of last year; the average yield for 1894 being 76 against 90 for 1893.

The yield of sweet potatoes this year is 83, last year 89.

The yield of peanuts is put at 87, an increase of 1 over last year.

INDUSTRIAL AND AGRICULTURAL STATISTICS.

QUESTIONS TO CORRESPONDENTS.

1. Have any minerals been discovered in your county since September last; if so, what?
2. Have any new manufactories been established in your county since September last; if so, what?
3. Has your county a fence law; if so, what is it?
4. (a) How many farms in your county are devoted to the raising of blooded stock?
(b) Name of owners.
(c) What kind of stock are they breeding?
5. Have stock suffered from disease this year; if so, what, and what was the extent of loss?
6. Have you a dog law; if so, what is the tax?
7. Have the garden and field crops been damaged this year by insects or diseases; if so, state what crop and extent of injury?
8. Has your county experienced any drought this year; if so, what was the effect?
9. What percentage of the tobacco crop planted is standing?
10. What is the acreage of field peas for forage and for seed?
11. Are second crop potatoes raised in your county, and to what extent and with what success?
12. To what extent is German clover raised in your county, and with what success?
13. (a) To what extent are fertilizers used in your county, and with what results?
(b) What is the average price paid per ton?
(c) Has the accumulation, preserving and use of farm-yard manure increased?
(d) On what crops is it most used?
14. (a) Are there any Farmers' Clubs in your county?
(b) Give name of same, and name and address of secretary.
15. To what extent is butter produced for sale in your county?
16. (a) What water power have you in your county?
(b) Approximate horse-power at the different railroad crossings?
17. What is the financial condition of the farmers of your county?

Under each county will be found answers to the questions marked as above.

ANSWERS OF CORRESPONDENTS.

ACCOMAC.—1, —; 2, several barrel factories; 3, no; 4, (a) 1; (b) D. H. Denis, Temperanceville; (c) cattle and horses; 5, no; 6, yes, 50c. on males, \$1 on females; 7, the louse has damaged corn and oats to some extent; 8, in the lower sections drought has affected all crops slightly; 9, —; 10, very few sown and only used for green manuring; 11, yes, usually we have enough to supply seed and some to spare; 12, every farmer raises from $\frac{1}{2}$ to 10 acres; 13, (a) fertilizers are used to some extent on all crops, especially trucks; (b) \$33, (c) always increasing in this county, a good deal of labor spent in this direction; (d) sweet potatoes, corn, and other crops to a limited extent; 14, (a) yes, (b) Mappsville Farmers' Association, A. C. Hart, secretary; 15, only to a limited extent; 16, (a) of no great value, (b) —; 17, excellent—I believe they owe less and live better than any farming people in the State.

ALLEGHANY.—1, none; 2, none; 3, we have the "hog law" in part of the county; 4, (a) none, (b) —, (c) —; 5, none; 6, \$1 on males and \$2 on females; 7, the potato crop was injured by the potato bug; 8, the drought has been injurious to all crops, the hay and oat crops and grasslands have suffered the most; 9, —; 10, —; 11, —; 12, —; 13, (a) a good deal with satisfactory results, (b) \$20, (c) it is increasing each year, (d) mostly on wheat and trucks; 14, none; 15, only for home use; 16, (a) Jackson river, Pots creek, Dunlop creek, and Smith's creek; (b) —; 17, it is not encouraging, the price of farm products very low.

ALEXANDRIA.—1, none; 2, a brick yard; 3, no; 4, (a) —, (b) —, (c) —; 5, no; 6, we have one but it is not enforced; 7, —; 8, to some extent; 9, —; 10, —; 11, —; 12, I have not made a success growing it; 13, (a) —; (b) —; (c) —; (d) —; 14, (a) —, (b) —; 15, to a limited extent; 16, the Little Falls, Potomac river, and Four-Mile Run; (b) —; 17, —.

ALBEMARLE.—1, —; 2, —; 3, —; 4, (a) —, (b) W. Gordon Merrick and Captain R. J. Hancock are all I can recall, (c) horses; 5, —; 6, yes, I think it is \$1; 7, not more than usual; 8, yes, it cut short our crops; 9, —; 10, —; 11, none that I know of; 12, —; 13, (a) am not informed, but judge that far less than usual; (b) —, (c) yes, (d) —; 14, (a) yes, (b) —; 15, about a supply for the local demand; 16, (a) abundant; 17, not generally good.

AMELIA.—1, none; 2, none; 3, every man required to fence his own stock; 4, (a) —, (b) —, (c) —; 5, hog cholera to a limited extent; 6, no; 7, potato bugs damaged one-half the Irish potato crop; 8, partially; 9, 75 per cent.; 10, —; 11, —; 12, —; 13, (a) used largely and with good results, (b) \$25, (c) no, (d) tobacco; 14, (a) no, (b) —; 15, limited; 16, (a) —, (b) —; 17, average.

AMHERST.—1, none; 2, none; 3, every one has to fence his own stock; 4, (a) none at present, (b) —, (c) —; 5, no; 6, our dog law takes effect 1st July, 1895, the tax is fifty cents per head; 7, no; 8, we had more than an average of dry weather during the spring and then a drought from the 5th of June to the 22d July; 9, about one-half; 10, it is not a crop here; 11, —; 12, —; 13, (a) used with good results on tobacco, (b) —, (c) it has, (d) tobacco and wheat; 14, (a) none, (b) —; 15, generally, but not any large amount; 16, (a) abundant throughout the county, (b) —; 17, as a general thing they are without capital, but freer from debt than two years ago.

APPOMATTOX.—1, none; 2, broom factory will start up this fall; 3, no; 4, (a) —, (b) —, (c) —; 5, no; 6, no; 7, no; 8, in some parts of the county cut short

tobacco and corn about one-half; 9, 80 per cent.; 10, —; 11, no; 12, do not know of any; 13 (a) every farmer uses them, result depends upon the season; (b) \$25, (c) it has to some extent, (d) tobacco; 14, (a) one and several alliances, (b) L. E. Smith, Appomattox C. H., is secretary of the county alliance; 15, sufficient to supply the local demand; 16, (a) enough to supply all demands, (b) —; 17, as everywhere else, some with money to loan and some living on mortgaged farms.

AUGUSTA.—1, none; 2, none; 3, goats and sheep not allowed to run at large; 4, (a) five, (b) W. H. Brew, H. H. Hamilton, Hamrick Brothers, G. J. Pratt, Samuel Byers; 5, no; 6, yes, 50 cents on males and \$2 50 on females; 7, grapes, by rose bugs; 8, yes, injured wheat, hay, oats, corn, and pastures; 9, —; 10, —; 11, no; 12, none; 13 (a) universally on wheat and grass with good results, (b) \$13 to \$20; (c) no, (d) fallowed with wheat when with grass is sowed; 14, (a) two, (b) James R. Kemper, Fishersville; S. M. Donald, Staunton; 15, most farmers raise more than they use; 16, (a) North river, Middle river, South river, Naked creek, and Christian's creek; (b) —; 17, sound.

BATH.—1, none; 2, none; 3, no; 4, —; 5, no; 6, no; 7, very little; 8, it has been very dry this season, and crops have been injured; 9, none raised; 10, none raised; 11, no; 12, none raised; 13, (a) generally and with good results, (b) \$18, (c) no, (d) corn and oats; 14, (a) no, (b) —; 15, no dairies, but the farmers generally make a surplus; 16, (a) all of our flouring mills are run by water, (b) —; 17, good.

BEDFORD.—1, none; 2, none; 3, yes, 4½ feet high, 3 wires, poles, or rails; 4, —; 5, no; 6, 50 cents per head; 7, no; 8, yes, cut short hay and oat crops; 9, 90 per cent.; 10, —; 11, no; 12, —; 13, (a) used principally on wheat and tobacco crops; do not think the results are financially successful; (b) \$25, (c) I think it has, (d) tobacco; 14, —; 15, to a limited extent; 16, James and Staunton rivers and numbers of large creeks; 17, very good.

BLAND.—1, none; 2, none; 3, fences are required to be five feet high; 4, none; 5, no diseases except distemper among horses, which has been general and severe; 6, none; 7, the rose bugs damaged more or less all garden crops; 8, droughts have visited nearly every section of our county, but the only serious result is short pastures; 9, none planted; 10, none planted; 11, no; 12, I do not know of any grown; 13, (a) perhaps one-half of our farmers use fertilizers, results generally good; (b) —, (c) to a small extent, (d) corn and wheat; 14, none; 15, a great deal of butter is produced and sold; 16, (a) fine water power; 17, not good, a good many farmers in debt.

BOTETOURT.—1, none; 2, canning factory, Wm. Pettigrew, Bessemer, proprietor; a whiskey distillery at Dagger's Springs; 3, hogs not allowed to run at large; three strands of wire, rails or plank is a lawful fence; 4, (a) three, (b) H. E. and W. S. McClung, Captain Cook, and Joseph Buhman; (b) Jersey and Durham cattle and Poland China hogs; 5, no; 6, no; 7, the corn worm was very bad on corn; the grub worm and potato bug also gave trouble; 8, bad drought; corn, tomatoes and grass all cut short from one-quarter to one-half; 9, little planted; 10, few sown; 11, no; 12, just commencing to seed it; 13, (a) a great deal is used and with good results, (b) \$18, (c) yes, (d) grass, corn, and potatoes; 14, none; 15, no more than is consumed in the county; 16, James river, Craig's, Catawba, Longentry, and Sinking creeks; all very fine; 17, very good.

BRUNSWICK.—1, none; 2, a saw-mill or two have been started; 3, no; 4, —; 5, none; 6, none; 7, potato bugs have caused some damage; 8, the drought we

had injured potatoes to some extent ; 9, 75 per cent. ; 10, — ; 11, very few plant the second crop ; 12, about one-half the farmers raise it with success ; 13 (a) nearly all the farmers use it with good success, (b) \$25, (c) no, (d) tobacco, cotton, and corn ; 14, none ; 15, to a very limited extent ; 16, (a) we have fine water power, (b) — ; 17, they owe less than they have for a long time.

BUCKINGHAM.—1, iron pyrites, containing gold and silver in large quantities ; 2, no ; 3, no ; 4, (a) two, (b) Gen. T. M. Logan, A. F. Brady ; (c) former, horses, latter, Jersey cattle ; 5, none ; 6, none ; 7, no ; 8, yes, very serious ; oats, hay, wheat, gardens, and pastures badly damaged ; 9, 90 per cent. ; 10, — ; 11, no ; 12, none grown ; 13, (a) very little used, (b) —, (c) no, with a few exceptions ; (d) tobacco and corn and top-dressing for grass ; 14, no ; 15, very little for sale outside of local demand ; 16, (a) numerous branches and creeks, (b) — ; 17, fair.

CAMPBELL.—1, none ; 2, none ; 3, none, 4, none ; 5, hogs have suffered in some sections from cholera ; 6, yes, it goes into operation in 1895 ; the tax is \$1 per head ; 7, potato bugs, cabbage bugs and worms, chick bug in wheat, oats, and corn have done much damage ; 8, drought in spring and latter part of summer injured hay, wheat, corn, oats, and tobacco ; 9, 75 per cent. to 90 per cent. ; 10, do not know ; 11, only a few have attempted it and with no success ; 12, but little and with moderate success ; 13, (a) largely on tobacco, and with varying results ; (b) \$25, (c) has decreased, (d) gardens, tobacco, and corn ; 14, none, 15, no more than for home consumption ; 16, James river, Falling, Otter, Staunton, Blackwater, and numerous smaller streams ; (b) — ; 17, the majority say "exceedingly bad" ; but my opinion is they imagine their condition much worse than it really is ; grumbling is contagious.

CAROLINE.—1, none ; 2, none ; 3, every man is required to fence his own stock ; 4, (a) three, (b) J. B. Washington, C. T. Smith, and Tom Boulware ; (c) cattle and horses ; 5, no ; 6, no ; 7, millet by army worm, cabbage by cabbage lice, and corn by wire worm ; 8, the most severe for several years ; 9, — ; 10, larger than I have ever known ; 11, for first time this year considerable planted, but small yield ; 12, some this summer for first time ; 13, (a) less than formerly, (b) \$35, (c) very much, (d) tobacco, wheat, grass, and potatoes ; 14, none ; 15, very considerable and on constant increase each year ; 16, (a) there are various streams that furnish water power, (b) — ; 17, all of them are without much money, but owe very little, and are living inside of their means.

CARROLL.—1, none ; 2, none ; 3, no ; 4, (a) none ; 5, no ; 6, no ; 7, no ; 8, yes ; injured grass and pastures a good deal and cut corn short ; 9, — ; 10, — ; 11, no ; 12, none raised ; 13 (a) it is used largely and with good results, (b) \$20, (c) yes, (d) wheat and corn ; 14, none ; 15, a great deal of butter is produced and sold from here ; 16, (a) good as can be found, (b) — ; 17, my opinion is that farmers as a rule are behind and in debt. This is due to the low prices of stock and farm produce.

CHARLES CITY.—1, none ; 2, none ; 3, all persons are required to fence in their stock ; 4 (a) five, (b) T. M. Hewitt, Robert Bradley, T. W. Willcox, J. D. Otey, R. B. and W. F. Knox ; (c) standard-bred and thoroughbred horses, Jersey cattle, and Poland China hogs ; 5, no ; 6, no ; 7, not materially ; the potato bug damaged early Irish potatoes slightly ; 8, yes ; hay, potatoes, and corn were greatly damaged ; 9, — ; 10, merely nominal ; 12, to no great extent ; 13 (a) largely on wheat and grass, (b) \$24, (c) yes, (d) vegetables and corn ; 14, no ; 15, it is produced for Norfolk and Richmond markets ; 16, (a) only sufficient to run three

mills about nine months in the year, (b) — ; 17, while farmers complain of low prices, those that have crops, &c., for sale are able to compare their position favorably with their brother farmers throughout the State.

CHARLOTTE.—1, none ; 2, saw-mill at Keysville ; 3, the "no-fence law" ; 4, (a) a few, (b) W. M. Watkins, Randolph ; H. C. Rice, Aspinwall ; W. S. Morton, Hill-andale ; (c) Percheron horses, Holstein cattle, Shropshire and Oxford cross sheep ; 5, none ; 6, no ; 7, the potato bug damaged the Irish potato crop seriously ; millet and sowed corn were also damaged ; 8, there was lack of rain between the 26th of February and 26th of June, which damaged all crops to some extent ; 9, 90 per cent. ; 10, not extensively planted ; 11, many attempted this season but failed ; 12, it has been tried by some, but with no flattering success ; 13 (a) 1,500 tons at least, (b) \$20 to \$30, (c) no ; a great waste is made of this article ; (d) tobacco ; 14, none ; 15, to no great extent ; 16, (a) a number of streams afford excellent water power ; 17, no material change ; hard times have made them less extravagant. A great deal of the business is now done through a system of exchange.

CHESTERFIELD.—1, none ; 2, a canning factory at Bermuda Hundred ; 3, rail or wire fence $4\frac{1}{2}$ feet high ; 4 (a) five, (b) H. C. Chamblin, Cox & Brother, James Ruffin, J. P. Gilliam, and Joseph Walker ; (c) trotting and running horses ; 5, cows have died from some disease similar to murrain ; 6, fifty cents on males and seventy-five cents on females ; 7, tomatoes, Irish potatoes, and cabbage damaged by insects ; 8, no ; 9, 90 per cent. ; 10, farmers are sowing more than usual ; 11, not a great many planted, but profitable where planted ; 12, this crop is much more largely raised, and was quite a success this year ; 13, (a) little used, (b) \$22 50, (c) yes, (d) on truck crops ; 14, — ; 15, a large quantity is made for sale in Richmond, Manchester, and Petersburg ; 16 (a) the James and Appomattox rivers and Swift and Falling creeks ; 17, not encouraging.

CLARKE.—1, no ; 2, one steam-roller flour mill at Berryville ; 3, every one must fence against stock ; 4 (a) two, (b) M. McCormick, Berryville, Va., and Jesse Tyson, Baltimore, Md. ; (c) trotting stock ; 5, not to any extent ; 6, seventy-five cents on each dog, hounds in packs excepted ; 7, potato bugs have caused some damage ; 8, corn crop damaged 40 per cent., pastures burnt up ; 9, none raised ; 10, none raised ; 11, no ; 12, little raised ; 13 (a) always used on wheat, (b) \$20, (c) no, (d) corn ; 14, no ; 15, we have one small creamery ; 16, the Shenandoah river and some smaller streams, (b) — ; 17, the farmers are generally in straightened circumstances ; wheat only 48 cents at this time.

CRAIG.—1, no ; 2, a roller-process flour mill and a tannery at Newcastle and a canning factory at Craig City ; 3, none ; 4, none ; 5, no ; 6, none ; 7, slight damage has been done to cabbage by the cabbage worm and to corn by the wire worm ; 8, there was a drought in June and July that injured hay and pasture lands considerably ; 9, none raised ; 10, none raised ; 11, no ; 12, not raised ; 13, (a) very little used, (b) —, (c) not much, (d) it is thrown broadcast on the fields ; 14, no ; 15, the aggregate is considerable ; 16, (a) the Meadow and John's creeks furnish very good water power, (b) — ; 17, generally easy.

CULPEPER.—1, none ; 2, one cigar factory and one flour mill ; 3, State fence law ; 4, (a) three, (b) S. R. Smith, Alwyn Dangerfield, and J. T. Johnson ; (c) trotters and saddle horses ; 5, no ; 6, general dog law ; 7, the potato bug and cabbage worm caused a good deal of damage ; 8, we had a dry spell that injured oats considerably ; 9, — ; 10, not much used ; 11, no ; 12, — ; 13, (a) a good deal is used, (b) \$12 to \$28, (c) not much, (d) wheat and oats ; 14, none ; 15, we have one

creamery at Brandy Station ; 16, (a) many good sites on the Rappahannock, Hazel, and Rapidan rivers and branches ; 17, probably not as good as for two or three years, owing to low prices of grain and stock.

CUMBERLAND.—1, none ; 2, none ; 3, every one is required to fence his stock ; 4, none ; 5, a few cases of Texas fever ; loss slight ; 6, no ; 7, Irish potatoes and cabbages considerably damaged by insects ; 8, we had quite a protracted drought in the early summer that seriously damaged the oat, corn, and tobacco crops and vegetables ; 9, 75 per cent. ; 10, grown but little ; 11, a few tried it as an experiment ; success poor ; 12, the introduction of the crop quite recent ; it has succeeded very well ; 13, (a) quite largely used for many years with varying success, (b) \$25, (c) I think not, and to this neglect, in great measure, is due the lack of agricultural prosperity ; (d) tobacco and corn ; 14, none ; 15, many farms produce butter of fine quality for the market ; 16, (a) the Appomattox and Willis rivers and tributaries, (b) from 20 to 50 ; 17, many energetic and judicious farmers in easy circumstances, while others, for lack of these qualifications, are largely in debt and unable to meet their obligations. Low price of products and adverse seasons are to be considered also in accounting for their condition.

DICKENSON.—1, none ; 2, none ; 3, people must fence against stock ; 4, none ; 5, hogs have suffered a good deal from cholera ; 6, no ; 7, potatoes, cabbage, and corn have suffered from insects and worms ; 8, in some sections damage most to gardens and corn ; 9, 90 per cent. ; 10, none ; 11, no ; 12, none raised ; 13, (a) none used, (b) —, (c) yes, 10 per cent. ; (d) on gardens and corn ; 14, no ; 15, to only a small extent ; 16, (a) only for grist mills ; 17, not encouraging.

DINWIDDLE.—1, no ; 2, no ; 3, one-half of the county fences crops, the other fences stock ; 4, (a) three, (b) John McGill, Dr. D. W. Lassiter, and J. R. Ayers, Petersburg, Va. ; (c) cattle and horses ; 5, less this year than for many years ; 6, no ; 7, the army worm has damaged some fields of millet ; 8, we had a drought in May which seriously damaged the crop of hay ; 9, 95 per cent. ; 10, at the least, 200 acres ; 11, yes, to a limited extent, and with variable success ; not reliable ; 12, nearly every farmer has from one to two acres and many from four to six ; quite a success ; 13, (a) all practical and successful farmers use fertilizers at from 200 to 1,000 pounds per acre ; with proper rotation the large quantity does best ; (b) \$25, (c) yes, nearly every farmer is trying to increase the quantity of farmyard manure ; (d) on tobacco, cotton, and peanuts ; 14, (a) Montross Grange, No. 28 ; (b) Thomas F. Rives, Gunshill, Va. ; 15, to a limited extent, as a rule ; 16, the Nottoway and Appomattox rivers and smaller streams ; 17, as a rule our farmers are not very much in debt.

ELIZABETH CITY.—1, none ; 2, none ; 3, the majority of the county has the "no-fence law" ; 4, none ; 5, no disease of any consequence ; 6, no ; 7, none but the potato and cabbage bugs ; 8, — ; 9, — ; 10, 300 ; 11, they are extensively and successfully ; 12, we are just beginning to experiment with it ; 13, (a) extensively and with satisfactory results, (b) \$35, (c) not to any extent, (d) trucks and corn ; 14, none ; 15, some raised for home markets ; 16, none but that created by the rise and fall of our salt tides ; 17, good, I think.

FAIRFAX.—1, none ; 2, a spoke factory at Wiehl, refrigerator factory at New Alexandria, and several saw mills ; 3, in Mount Vernon, Providence, and Falls Church districts the land-owner's line is his legal fence ; 4, (a) none, (b) —, (c) — ; 5, some tuberculosis, but not extensive ; 6, yes, 50 cents ; 7, potato bugs are numerous ; 8, yes, affected corn crop ; 9, no tobacco grown ; 10, very few

sown; 11, very few; 12, —; 13, (a) largely used, with varying results, (b) \$20, (c) yes, (d) corn and wheat; 14, (a) Woodland Farmers' Club, (b) —; 15, —; 16, (a) abundant, (b) —; 17, while the idleness of the farmers is no greater than usual, there is general complaint of hard times and scarcity of money.

FAUQUIER.—1, no; 2, no; 3, yes, farmers must fence against horses and cattle but not against hogs and sheep; 4, (a) three, (b) Samuel McMillan, Andrew Low, Thomas Henderson; (c) horses, sheep, hogs, and cattle respectively; 5, no; 6, yes, \$1 on males, \$2 on females; 7, no; 8, yes, almost ruined crops; 9, none grown; 10, I don't know; 11, no; 12, small extent; 13, (a) largely, good results; (b) \$22 50, (c) no, (d) wheat; 14, (a) no, (b) —; 15, considerable; 16, (a) immense water power, (b) —; 17, fair condition.

FLOYD.—1, none; 2, none; 3, has none; 4, (a) none, (b) —, (c) —; 5, nothing unusual; 6, none; 7, rose bug has been very destructive to the grapes; 8, one portion of the county has suffered badly; 9, 80 per cent; 10, —; 11, not raised; 12, to no extent; 13, (a) much used on wheat and tobacco, (b) \$15, (c) I do not think it has, (d) corn and wheat; 14, (a) one, (b) Floyd Corn Club, Dr. C. N. Stiglema, Floyd, Va.; 15, to a large extent; 16, (a) —, (b) —; 17, as good as can be found anywhere in the State.

FLUVANNA.—1, iron; 2, yes, flour and grist mill at Middleton, Va.; 3, none; 4, (a) only one extensively, (b) C. E. Jones and very many other farmers have commenced raising blooded stock, (c) saddle and trotting horses; 5, no; 6, not yet; 7, not to any extent; 8, serious; corn, oats, and tobacco badly injured; 9, about 75 per cent.; 10, 25 per cent.; 11, no; 12, not much planted; 13, (a) largely and with good results, (b) about \$15, (c) no, (d) tobacco; 14, (a) no, (b) —; 15, great quantity shipped by country stores; 16, (a) as good as anywhere, (b) —; 17, generally free from debt; making a good living, but little money.

FRANKLIN.—1, none; 2, none; 3, none; 4, (a) several, (b) Peter Saunders, Jacob Neff, Benjamin Hutchin, and others; (c) principally sheep; 5, no; 6, no; 7, wheat and corn damaged by chinch bug, but not to much extent; 8, it has through August and up to 17th of September; no rain; corn and tobacco crop cut short; 9, 30 per cent.; 10, only for table use; 11, no; 12, very little grown, but does well; 13, (a) used on all the tobacco and some on wheat, (b) about \$28, (c) it has not, (d) wheat and corn; 14, (a) none, (b) —; 15, considerable butter is sold to the merchants, but no dairying; 16, (a) Pig and Blackwater rivers and several small streams; (b) —; 17, farmers who are out of debt are able to stand hard times by closest economy. Those in debt see but little prospect of getting out.

FREDERICK.—1, no; 2, the Winchester Knitting Mills; 3, yes; every man's line is his fence, but line fences where beneficial to both sides must be kept up by adjoining owners; 4, (a) I do not know of any exclusively so used, but most every farm has improved stock of one or more kinds; (b) —, (c) horses, cattle, sheep, and hogs, and almost every known breed is represented; 5, no; 6, yes, 75 cents; 7, a few grasshoppers in places, but no serious damage done; 8, a little too dry in August and September, but no serious damage; 9, don't raise the weed; 10, practically none; 11, no; 12, none that I know of; some crimson sown this fall or late summer; 13, (a) almost every acre seeded to wheat has about 200 pounds applied, and some little put on corn, oats, potatoes, &c.; pays well generally; (b) perhaps about \$20, (c) I think it is more carefully saved, though not much more made; (d) commercial on wheat, farm-yard on corn; 14, (a) two, I think; (b) Mu-

tual Farmers' Club, Levy Boyer, Winchester, Va., secretary; Opequon Farmers' Club, J. A. Miller, Nineveh, Clarke county, secretary; 15, it is an important industry, but I cannot say how much; one large butter factory; 16, (a) it is well provided, (b) cannot tell; 17, heretofore it has been good, but 47 cents' wheat is making it very hard for them just now.

GLOUCESTER.—1, —; 2, —; 3, the old Virginia fence law; in one district we have no fence law against hogs and it works well; 4, (a) —, (b) —, (c) —; 5, —; 6, no; 7, potato and melon bugs have given trouble; 8, early in season grass was cut short; 9, —; 10, —; 11, some few, with fair success; 12, —; 13, (a) used on trucks with good results, (b) \$25, (c) —, (d) corn and trucks; 14, (a) no, (b) —; 15, —; 16, (a) a few small mill-ponds, (b) —; 17, truckers are doing fairly well; raising wheat, &c., at present prices does not pay.

GRAYSON.—1, none; 2, one roller mill for flour; 3, no; 4, (a) five, (b) S. M. Fulton, Eli Hale, Ephraim Boyer, B. F. Nuckolls, and Columbus Phipps; (c) horses, cattle, and sheep; 5, no; 6, no; 7, no; 8, yes, crops are short, especially hay, not being half a crop; 9, —; 10, not grown; 11, no; 12, not grown; 13, (a) to a considerable extent, with satisfactory results; (b) about \$20, (c) yes, (d) wheat and corn; 14, (a) no, (b) —; 15, to a considerable extent; there is no means of ascertaining the amount; 16, (a) as fine, if not finer, than any county in the State; (b) —; 17, there are very few farms mortgaged in the county.

GREENE.—1, none; 2, none; 3, no fence laws; Rapidan river is a legal fence; 4, (a) none, (b) —, (c) —; 5, none; 6, none; 7, no; 8, drought, which ended second week in July, curtailed corn crop, spring oats, and grass; 9, 90 per cent; 10, —; 11, no; 12, none; 13, (a) three-fourths of the farmers use fertilizers, with moderate results; (b) \$15, (c) rather on the increase, (d) tobacco and wheat; 14, (a) none, (b) —; 15, many farmers produce good quantities; 16, (a) Rapidan, Swift, Williams, and South rivers and other streams; (b) —; 17, fairly good.

GREENESVILLE.—1, none; 2, one steam grist mill at Emporia, owned by Charles Baker; 3, no; 4, (a) none to strictly blooded stock, (b) —, (c) —; 5, yes, to some extent; 6, no; 7, yes, cabbage has suffered from some disease; 8, yes, in a strip about five miles east and west the drought was considerable; in other portions the crops were never better; 9, very little was planted here, owing to drought; 10, there seems to be more than ever before, but don't know the extent; 11, yes, some are very successful and raise seed to sell, while others never get them to come up; 12, to a limited extent, but it does well; 13, (a) yes, to some extent, but not as much as formerly; (b) don't know, (c) yes, but not as much as it should; (d) cotton, peanuts, and potatoes; 14, (a) some Alliance clubs, (b) don't know; 15, to a very limited extent; 16, (a) considerable, (b) 1,500; 17, poor, but they seem to be getting on their feet again.

HALIFAX.—1, none; 2, one new rolling-mill for flour on Sandy creek, owned by A. G. Roal, and also a wheat and corn mill, owned by Early & Hankins; 3, yes, it requires every person to fence his own stock; 4, (a) —, (b) C. T. Bethel, News Ferry, and Daniel W. Owen, Black Walnut; (c) —; 5, not heard of any; 6, no dog law; 7, the dry-weather bugs caused almost a failure in cabbage and potatoes; 8, in some portions of the county a very serious drought caused short crops of wheat, oats, and tobacco; 9, about 50 per cent.; 10, 100 per cent.; 11, very few; twice it failed; 13, (a) usually a large quantity is used, with good success; (b) about \$23, (c) it has, (d) tobacco and wheat; 14, (a) none, (b) —; 15, very

little for market ; 16, (a) very fine, (b) — ; 17, the farmers are generally making very little, but not very much in debt.

HANOVER.—1, no ; 2, cannery (Butler & Vaughn), near Ellerson's, and a flour mill near Ashland, owned by W. C. Newman ; 3, no ; 4, (a) —, (b) —, (c) — ; 5, no ; 6, yes, 50 cents on males and \$1 on females ; 7, cut worms did considerable damage to early crops ; 8, crops badly damaged by drought in June and July ; 9, — ; 10, — ; 11, yes, very few raised ; 12, a large majority of our farmers raise a small crop ; very successful ; 13, (a) largely used by truckers, with good results ; (b) —, (c) about as usual, (d) melons and wheat and grass ; 14, (a) yes, (b) — ; 15, — ; 16, (a) North and South Anna rivers and a number of small creeks, (b) — ; 17, very good, especially among the truckers.

HENRICO.—1, no ; 2, no ; 3, owners of stock must take care of them ; are liable for all damage from stock at large ; 4, (a) several, but names not given ; (b) —, (c) horses, cattle, hogs, and sheep ; 5, very little ; 6, no ; 7, potatoes, tomatoes, carrots, and beets have suffered from the blister worm, and cabbage has suffered from green worms and harliquin bugs ; millet has been attacked by the army worm ; 8, yes, in July ; 9, not grown ; 10, small ; 11, to some extent ; 12, extensively and with success ; 13, (a) stable manure used when it can be obtained ; fertilizers cost too much for general farm crops ; (b) do not know, (c) not much, (d) used on all crops ; 14, (a) no, (b) — ; 15, not very much ; 16, (a) abundant, (b) — ; 17, in debt to no great extent.

HENRY.—1, no ; 2, a tobacco factory at Boxwood postoffice, run by Mitchell & Dunlop ; 3, we have the "no-fence" law ; 4, (a) one, (b) J. H. Scales, Byrdville, Va. ; (c) horses and hogs ; 5, not to any considerable extent ; 6, no dog tax ; 7, corn and potatoes seriously damaged by worm and bug ; 8, the county has been dry generally since May 19th ; corn crop suffered to some extent ; 9, 80 per cent. ; 10, only a little for forage ; 11, no ; 12, none ; 13, (a) fertilizers are generally used on the tobacco crops, on which 150 to 200 pounds per acre is used ; (b) \$20 to \$30, (c) no, (d) tobacco and gardens ; 14, (a) no, (b) none ; 15, no careful attention given to it ; 16, (a) abundant, (b) 500 to 1,000 in a mile or two ; 17, not largely in debt.

HIGHLAND.—1, none ; 2, none ; 3, none ; 4, (a) none exclusively, (b) —, (c) — ; 5, nothing serious ; 6, no ; 7, — ; 8, grass, corn, buckwheat and potatoes have suffered from drought ; gardens were cut short ; 9, — ; 10, — ; 11, none raised ; 12, none ; 13, (a) to only a moderate extent, with good results ; (b) — ; (c) rather increased, (d) on wheat and corn ; 14, (a) no, (b) — ; 15, none to any extent ; 16, (a) —, (b) no railroad ; 17, fair.

ISLE OF WIGHT.—1, — ; 2, — ; 3, ten feet, four rails made five feet high ; 4, (a) none, (b) —, (c) — ; 5, hog cholera is prevailing now ; 6, yes, 50 cents each ; 7, none ; 8, no ; 9, none raised ; 10, about as usual ; 11, to little extent, but under difficulties ; 12, not much raised ; 13, (a) quite extensively, and with good results ; (b) \$20 to \$25, (c) yes, (d) potatoes, melons, peas, &c. ; 14, (a) —, (b) — ; 15, on a small scale ; 16, (a) only artificial dams for grinding corn and wheat, (b) — ; 17, fair.

JAMES CITY.—1, none ; 2, one barrel factory ; 3, the boundary line is a lawful fence ; 4, (a) none, (b) —, (c) — ; 5, — ; 6, none ; 7, melons slightly damaged by melon bugs ; 9, — ; 10, — ; 11, yes, good many, and with good success ; 12, with good success ; 13, (a) largely, and with good results, particularly on truck crops ; (b) \$35, (c) yes, to a large extent ; (d) truck ; 14, (a) none, (b) — ; 15, for home use ; 16, (a) abundant, (b) — ; 17, only fair.

KING & QUEEN.—1, none ; 2, none ; 3, the old system of keeping up a lawful fence ; 4, (a) none, (b) —, (c) — ; 5, none ; 6, no ; 7, not more than usual ; the potato bug and cabbage worm chiefly ; 8, a very considerable and extended one in the spring shortened wheat, oats, and grass and the very early corn ; 9, 90 per cent. ; 10, average quantity ; 11, yes, to a limited extent ; 12, in a small and successful way ; 13, (a) considerably ; results satisfactory ; (b) about \$22, (c) not generally, (d) garden truck and tobacco ; 14, (a) none, (b) — ; 15, only the surplus of the household supply is sold ; 16, (a) abundant, (b) no such crossings ; 17, very good.

KING GEORGE.—1, none : 2, one tomato canning factory ; 3, have to fence stock in ; 4, (a) three, (b) J. S. Jones, George Turner, R. Taylor ; (c) race horses ; 5, yes, greatly ; disease unknown ; lost about fifteen head of horses ; 6, none ; 7, damaged by insects ; cabbage 20 per cent ; 8, yes, drought affected all crops about 10 per cent ; 9, 10 per cent ; 10, 50 per cent ; 11, yes, with very poor success ; 12, none ; 13, (a) to a considerable extent, (b) \$30, (c) yes, to a great extent ; (d) wheat, oats, and corn ; 14, (a) yes, (b) Farmer's Alliance ; 15, very poor ; 16, (a) abundant, (b) none ; 17, owing to the panic, many of the farmers are complaining of scarcity of finances.

KING WILLIAM.—1, no ; 2, no ; 3, we have the "no-fence" law ; 4, (a) eight, (b) W. V. Croxton, L. S. Robinson, J. C. Cooke, B. C. Garrett, L. C. Burke, William McGary, Roger Gregory, Jr., and John Haw ; (c) running and trotting horses, sheep, hogs, and cattle ; 5, no ; 6, no ; 7, no ; 8, yes, damaging ; 9, 95 per cent. ; 10, — ; 11, yes, with fairly good success, but to no great extent ; 12, the crop is on the increase every year ; 13, (a) to a great extent, with improved results ; (b) \$25, (c) yes, (d) grass and truck ; 14, (a) none, (b) — ; 15, to a very limited extent ; 16, (a) about as good as the average county in Tidewater, (b) — ; 17, fair.

LANCASTER.—1, none ; 2, none ; 3, each man's line is a lawful fence ; 4, none ; 5, no ; 6, no ; 7, no ; 8, yes, early trucks and fruit cut short and hay also damaged ; 9, — ; 10, only a few sowed for fallow ; 11, yes, mostly for seed ; average yield, 50 to 75 bushels per acre ; 12, farmers only experimenting in a small way ; 13, (a) all the best farmers use them and more liberally every year, with fair results ; (b) \$25, (c) decidedly, (d) trucks ; 14, no ; 15, only what can be spared from family use ; 16, only a few small ponds ; 17, money is very scarce and produce of all kinds low, but farmers generally are holding their own very well, and are trying to do business as much for cash as possible.

LEE.—1, none ; 2, none ; 3, general fence law ; 4, (a) two, (b) L. B. Quillan and Wright Stickley, (c) cattle and hogs ; 5, nothing but hog cholera to a small extent ; 6, no ; 7, not to any extent ; 8, no drought until the last six weeks, which has cut pastures short ; 9, — ; 10, — ; 11, no ; 12, none raised ; 13, (a) very little used, (b) \$30, (c) considerably, (d) corn and grass ; 14, none ; 15, very little butter sent from the county ; 16, Powell's river and tributaries ; 17, I believe, as a general rule, the farmers are in as good condition financially as they have been for the last ten years.

LOUDOUN.—1, none ; 2, two roller-process flour mills, capacity 75 and 50 barrels per day respectively ; 3, yes, but law not given ; 4, (a) one exclusively, (b) Henry Fairfax, (c) hackney coach horses ; 5, some distemper in horses and tuberculosis in dairy herds ; loss slight ; 6, yes, 75 cents per head ; 7, not extensively ; 8, yes, perhaps the most severe since 1854 ; oats, corn, grass, and garden crops damaged at least 40 per cent ; 9, none planted ; 10, none planted ; 11, no ; 12, not planted ;

13, (a) heavily and universally used with small grains, usually with good results; (b) \$22, (c) no, (d) wheat and corn; 14, (a) one, the Catocin Club; (b) D. H. Vandevanter, Waterford; 15, enough to supply the markets and a considerable surplus for shipment to the cities; 16, abundant and first-class in character; numerous tributaries of the Potomac cut the county in all directions; 17, depressed on account of low prices. Money is scarce among the farmers.

LOUISA.—1, none; 2, none; 3, five feet is a lawful fence; 4, (a) six, (b) W. A. Melcomb, Richard Morris, George Morris, Frank Morris, Thad. Johnson, John Morris; (c) horses, cattle, sheep; 5, no; 6, no; 7, no more than usual; 8, yes, shortened spring oats, hay, corn, and tobacco in some localities seriously; 9, 66 per cent; 10, none to mention; 11, no; 12, very little raised; 13, (a) generally used, and with good results; (b) \$16 to \$25, (c) no, (d) tobacco and gardens; 14, no; 15, a good deal made; 16, all that will ever be needed; 17, by hard work and harder economy they are keeping out of debt, but gradually getting poorer.

LUNENBURG.—1, none; 2, none; 3, "no-fence" law; 4, none; 5, no; 6, no, but we ought to have; 7, the cabbage and Irish potato crop have suffered from bugs and the corn crop from the wire worm; 8, tobacco was retarded some by dry weather; 9, 80 per cent; 10, none raised; 11, yes, but with poor success; 12, not to a great extent, but succeeds well; 13, (a) very largely used; results satisfactory; (b) \$30, (c) somewhat, (d) tobacco; 14, (a) the Flat Rock Club, (b) W. L. Bagley, Columbian Grove; 15, we hardly make a supply for home use; 16, (a) sufficient to run our grist and flour mills; 17, depressed on account of poor crops for several years.

MATHEWS.—1, none; 2, none; 3, two districts have a fence law against hogs; the boundary line of farms is a lawful fence against hogs; 4, none; 5, no; 6, no; ought to have; there has been great loss of sheep by worthless dogs; 7, potatoes, to some extent, from the potato bugs; 8, we had a severe drought in June and July; trucks, corn, oats, and hay were seriously retarded in growth; 9, —; 10, 500 acres; 11, not to a great extent, but generally with success; 12, —; 13, (a) fertilizers are liberally used, and, as a general thing, with satisfactory results, particularly on trucks; (b) \$30, (c) yes, it is regarded as the mainstay by every good farmer, (d) grass and corn; 14, no; 15, not enough made for home consumption; 16, there are two tide mills for grinding grain; 17, good; the fish and oyster industries are a great help; but for these the farmers would find that farming on our shallow soil is an uphill business.

MECKLENBURG.—1, none; 2, none; 3, owners required to fence stock; 4, several raise improved stock, but none exclusively blooded stock; 5, no; 6, no, the raising of dogs is at a premium; many persons who have no other stock have several dogs; 7, potatoes, cabbage, and melons have suffered some; the corn crop was damaged by the wire worm; 8, July was quite dry; the wheat and spring-oat crops were quite short; 9, 88 per cent; 10, the acreage has increased; 11, to a limited extent, but when a stand is obtained good crops are raised; 12, this crop is yielding in acreage and favor; 13, (a) fertilizers are used most entirely on tobacco and corn; 400 pounds per acre on tobacco and 200 pounds on corn; (b) \$25, (c) it has, (d) tobacco; 14, none; 15, none for shipment; 16, Roanoke and Meherrin rivers and tributaries furnish the finest water power; 17, not encouraging.

MIDDLESEX.—1, none; 2, none; 3, two districts fence in stock; every man's boundary his lawful fence; 4, none; 5, none; 6, none; 7, no; 8, yes, it destroyed one-third of the hay and corn crops; 9, —; 10, 500 acres; 11, they constitute

about one-tenth of the crop grown; 12, 10 per cent. of the farmers use it with satisfactory results; 13, (a) 90 per cent. of the farmers use fertilizers with success, (b) \$24, (c) yes, (d) hay sod; 14, none; 15, perhaps 5,000 pounds sold every year; 16, none; 17, thrifty; say 80 per cent.

MONTGOMERY.—1, no; 2, no; 3, no; 4, (a) one I know of, (b) C. B. McDonald, Blacksburg; (c) standard-bred trotting horses; 5, not to any extent; 6, an act was passed by the last Legislature, but has not yet taken effect; 7, not that I know of; 8, hay and pastures were seriously damaged, corn cut short and seeding delayed; 9, 100 per cent.; 10, —; 11, no; 12, very little; 13, (a) quite largely, probably twenty or twenty-five car-loads; (b) low-grade goods generally used, (c) yes, (d) general farm and garden; 14, —; 15, we have one dairy farm and many farmers sell small amounts; 16, considerable; 17, nearly all who live within their means are doing well, especially for the times.

NANSEMOND.—1, none; 2, basket factory, box and barrel factory, and knitting mills; 3, —; 4, (a) three, (b) L. W. Bradshaw, E. C. Ramsay, S. T. Ellis; (c) Jersey cattle; 5, no; 6, the tax is \$1 50; 7, no serious damage; 8, early in the season there was a slight drought; 9, none planted; 10, —; 11, generally raised and with gratifying success; 12, to a limited extent, but with success; 13, (a) to quite an extensive degree, not altogether with satisfactory results; (b) —, (c) ten tons are made now where one was made before, (d) trucks; 14, none; 15, to a very limited extent; 16, good, but not utilized; 17, fairly good.

NELSON.—1, rutile, kaolin, magnetic iron; 2, manufactory for preparing kaolin, Chambers & McKeever, proprietors; 3, —; 4, none; 5, no; 6, no; 7, no; 8, the corn crop, tobacco, and gardens suffered considerably from dry weather; 9, 75 per cent; 10, —; 11, none raised; 12, not raised; 13, (a) fertilizers are used on tobacco principally, (b) \$30, (c) I do not think it has, (d) on tobacco; 14, none; 15, not to any great extent; 16, there are five or six mills run by water; 17, generally hard run.

NEW KENT.—1, none; 2, barrel factory at Barhamsville; 3, boundary line lawful fence; 4, none; 5, none; 6, none; 7, no damage of any consequence; 8, the upper half of the county suffered from a drought; 9, none planted; 10, —; 11, a good many planted this year; 12, small lots, with success; 13, (a) more this year than in former years; results very good on Irish potatoes; (b) from \$20 to \$40, (c) yes, (d) corn, potatoes, and melons; 14, none; 15, very limited; 16, sufficient power for grist mills; 17, very little money, but out of debt, and gone down to hard work on their farms.

NORFOLK.—1, —; 2, —; 3, no fence law; 4, (a) one, (b) C. B. Lakin, (c) Jersey cattle; 5, no; 6, no; 7, summer cabbage in some cases has been destroyed; 8, we have had a very wet summer; 9, —; 10, don't know; 11, yes, it has become quite an important crop; 12, it is planted, and, as far as I know, it is a success; 13, (a) extensively used, (b) \$47, (c) I think not, (d) —; 14, (a) none that I know of, (b) —; 15, there are probably a dozen men engaged in making butter in this county; 16, (a) —, (b) —; 17, generally fair.

NORTHAMPTON.—1, none; 2, none; 3, none; 4, (a) none, (b) —, (c) —; 5, recently some horses have died, cause attributed to running on grass at night; 6, 50 cents on males, \$1 on females; 7, oats damaged by fly; 8, —; 9, none planted; 10, increasing; 11, considerable quantity planted this year for spring seeding; 12, on the increase and quite successful; 13, (a) extensively, with good

results; (b) \$37, (c) yes, (d) potatoes; 14, (a) do not know of any, (b) —; 15, very little; 16, (a) —, (b) —; 17, in bad shape.

NORTHUMBERLAND.—1, coal; 2, no; 3, no; 4, (a) none, (b) —, (c) —; 5, no; 6, no; 7, no; 8, yes, corn injured 25 per cent, potatoes 50 per cent; 9, —; 10, —, 11, yes, to a small extent; 12, small; good results; 13, (a) largely, and with good results; (b) \$20, (c) yes, (d) trucks; 14, (a) no, (b) —; 15, only for local market; 16, (a) enough to run local mills; (b) —; 17, in debt, though not extensively.

NORROWAY.—1, no; 2, no; 3, yes, the "no-fence" law; 4, (a) none, (b) —, (c) —; 5, no; 6, yes, \$2 per head; 7, potato bugs worse than I ever saw them; terrapin and little bugs damaged cabbage and tomatoes considerably; 8, very dry up to 15th of July; spring oats and hay crop almost total failure; 9, 95 per cent; 10, 75 per cent; 11, no; 12, very little raised; 13, (a) the use of fertilizers in this county is on the decrease yearly, (b) \$25, (c) yes, (d) tobacco; 14, (a) no, (b) —; 15, limited sales to local consumers; 16, (a) Big and Little Nottoway river and many smaller streams, (b) —; 17, 90 per cent of them in debt.

ORANGE.—1, no; 2, no; 3, no; 4, (a) six, (b) George W. Barbour, O. F. Brirree, C. C. Taliaferro, W. L. Bradbury, E. W. Scott, R. M. Newman; (c) horses, cattle, sheep, and hogs; 5, no; 6, 25 cents on males and 50 cents on females; 7, no more than usual; 8, yes, reducing corn one-quarter, and making the poorest pasture in years; 9, scarcely any planted; 10, none; 11, only as garden truck, and with poor results; 12, limited to experiments; does well; 13, (a) largely, with satisfactory results; (b) \$13 50, (c) yes, (d) corn and wheat; 14, (a) one, (b) Hole and Corner Club, C. J. Stovin, Jr., secretary; R. M. Newman, Somerset, corresponding secretary; 15, limited; 16, (a) abundant, (b) —; 17, the farmers are not at present in the best circumstances.

PAGE.—1, none; 2, none; 3, none; 4, (a) none, (b) —, (c) —; 5, have not; 6, yes, males, 50 cents; females, \$1; 7, —; 8, yes, gardens, pastures, millet, and corn all cut short; 9, don't use it; 10, none; 11, no; 12, not grown; 13, (a) universally on wheat, with good results; (b) \$20, (c) no, it has been carefully saved heretofore; (d) wheat; 14, (a) none, (b) —; 15, enough for home consumption; 16, (a) the Shenandoah river and tributaries, (b) —; 17, generally good.

PATRICK.—1, some pieces of gold ore found on land of J. H. Langel; 2, one canning and two tobacco factories; 3, no; 4, (a) none, (b) —, (c) —; 5, no; 6, no; 7, no; 8, the season was fair until middle of July; in sections upland corn is ruined and pastures are burned up; 9, 90 per cent; 10, not raised; 11, none grown; 12, know of only one who has tried it; he is pleased; 13, (a) used on tobacco, with good results; (b) \$25 cash, (c) —; (d) corn, wheat, and tobacco; 14, (a) no, (b) —; 15, fall and winter made is shipped to Danville and Lynchburg; don't know the extent; 16, (a) enough to drive all the machinery in the State, (b) —; 17, they have but little money, but are tolerably free from debt.

POWHATAN.—1, none; 2, canning factory on farm of D. B. Watkins; 3,000 cans per day; 3, every man's line is his fence; 4, (a) not exclusively, (b) —, (c) —; 5, I have heard of none; 6, no; 7, but little damage; 8, considerable dry weather in early part of season, causing short tobacco crop, but the corn crop is fair; 9, 75 per cent; 10, not many raised; 11, none grown; 12, only a small amount raised, but the cultivation is increasing, and it succeeds well; 13, (a) used extensively and successfully, (b) \$20 to \$25, (c) I think not, (d) on tobacco; 14, (a) none

that I know of, (b) — ; 15, very limited ; 16, (a) abundant, (b) — ; 17, as good, or better, than it has been for years.

PRINCE EDWARD.—1, none ; 2, none ; 3, every man's line is his lawful fence ; every man takes care of his stock ; 4, (a) one, (b) Major A. R. Venable, Jr. ; (c) Jersey ; 5, some horse distemper, but not serious ; 6, none ; 7, not more than usual ; 8, yes, short crops of wheat and oats and early vegetables injured ; 9, 75 per cent. ; 10, don't know ; small ; 11, no ; 12, very little ; 13, (a) used extensively on tobacco ; various results ; (b) about \$25, (c) not much, (d) tobacco ; 14, (a) yes, (b) Meherrin Farmers' Club, W. H. Ewing, Meherrin, secretary ; 15, enough to supply the demand of Farmville, Hampden-Sidney College, &c. ; 16, (a) Appomattox river, (b) — ; 10, not encouraging.

PRINCE GEORGE.—1, no ; 2, — ; 3, lines are lawful fences ; owners of stock must restrain them ; 4, (a) no, (b) —, (c) — ; 5, no ; 6, no ; 7, the potato bug, cabbage worm, and cut worm have done much damage ; 8, some in July that shortened the corn crop ; 9, a very little planted ; 10, none raised ; 11, small crops are raised, with some success ; 12, small patches are raised successfully ; 13, (a) about 10 per cent of the farmers use it, (b) from \$20 to \$25, (c) yes, (d) trucks ; 14, (a) none, (b) — ; 15, to a very small extent ; 16, (a) fair, (b) — ; 17, very poor, owing to the low price of all farm products.

PRINCE WILLIAM.—1, none ; 2, no ; 3, no general fence law ; 4, (a) none making a specialty of it, (b) —, (c) — ; 5, no ; 6, 75 cents per head ; 7, no ; 8, yes, the drought during June and July was quite severe and injured pastures and corn crop ; 9, none raised ; 10, not raised but by a few ; 11, no ; 12, none raised ; 13, (a) generally used, with fair results ; (b) \$15 to \$30, (c) yes, (d) corn and wheat ; 15, not largely produced ; 16, (a) quite a number of streams, (b) — ; 17, while few of our farmers are rich the majority are holding their own and are generally improving their property.

PULASKI.—1, no ; 2, no ; 3, no ; 4, (a) five, (b) H. M. Howe, W. J. Jordan & Son, W. W. Bentley, R. M. Crockett, S. P. Honaker ; (c) Hersford and short-horn cattle, Percheron and French coach horses, Shropshire sheep ; 5, — ; 6, no ; 7, potatoes by Colorado beetle and blister flies ; 8, yes, long-hay crop ruined ; pastures, potatoes, corn, wheat, and oats much reduced in yield ; 9, — ; 10, none ; 11, no ; 12, very little raised ; 13, (a) largely, with good results, (b) \$15, (c) no, (d) corn and wheat ; 14, (a) no, (b) — ; 15, don't know ; 16, (a) that afforded by New and Little rivers and their tributaries, (b) — ; 17, bad, in consequence of extremely low prices on farm products.

RAPPAHANNOCK.—1, none ; 2, none ; 3, the old five-foot fence law ; 4, (a) one, (b) George T. Daniel, Gaines X Roads ; (c) Durham cattle ; 5, none ; 6, none ; 7, cut worm has damaged corn ; 8, considerable ; 9, — ; 10, — ; 11, none raised ; 12, not raised ; 13, (a) a good deal used, with fair results ; (b) \$18, (c) increased but little, (d) wheat, corn, and meadows ; 14, (a) none, (b) — ; 15, by many in a very small way ; 16, (a) by the Rappahannock and several other rivers, (b) — ; 17, generally good.

RICHMOND.—1, none ; 2, none ; 3, no ; 4, (a) none, (b) —, (c) — ; 5, no ; 6, no ; 7, no ; 8, yes, a very bad one ; it has seriously injured the corn and killed nearly all the clover seeded this spring ; 9, — ; 10, — ; 11, no ; 12, it is raised to a considerable extent and is a success ; 13, (a) it is very generally used, (b) \$23, (c) yes, (d) trucks ; 14, (a) none, (b) — ; 15, very little made ; 16, (a) very fair, (b) — ; 17, fairly good.

ROANOKE.—1, none; 2, none; 3, Salem District has a fence law as to hogs; 4, (a) two, (b) D. T. Martin, G. M. Bowman; (c) Percheron horses; 5, no more than usual; 6, none; 7, corn and oats injured to some extent; 8, the severest drought for many years, ruining the oat, hay, and potato crops; 9, 85 per cent.; 10, none raised; 11, only raised for domestic use; 12, very few farmers seeded the crop this summer on account of drought; 13, (a) used by about 40 per cent. of the farmers; results excellent; (b) —, (c) no, (d) wheat and grass; 14, (a) none, (b) —; 15, none for shipment; 16, (a) Roanoke river, Catawba and several other creeks; (b) —; 17, good.

ROCKBRIDGE.—1, no; 2, no; 3, not required to fence against hogs; can recover damages also for crops injured by others' stock if fence is nine rails high; 4, (a) one, (b) E. T. Robinson, Jr., Fancy Hill; (c) Shropshire and Southdown sheep, Poland China and Chester Swine, Holstein cattle; 5, no; 6, 50 cents on males, \$1 on females; 7, no; 8, shortened hay and pastures; 9, 90 per cent.; 10, none; 11, no; 12, very little; 13, (a) largely used, and generally with good results; (b) \$20, (c) yes, largely, (d) wheat and corn; 14, (a) no, (b) —; 15, good deal made by farmers, but no creameries; 16, (a) James, North, and South rivers, and Buffalo and Cedar creeks; (b) —; 17, not good.

RUSSELL.—1, yes, gold and silver; 2, one saw-mill; 3, it has; five feet high; close and strong; 4, (a) yes, two; (b) Stuart Land and Cattle Company and H. C. Stuart; (c) horses and cattle; 5, none that I know of; 6, no; 7, no; 8, some, but not severe; 9, 75 per cent.; 10, don't know of any; 11, none raised; 12, limited; 13, (a) limited, and good results; (b) \$25, (c) yes, (d) corn, wheat, and meadows; 14, (a) none; (b) —; 15, a great deal on farms; no dairies; 16, (a) enough to run all the machinery in the State, (b) —; 17, generally hard up for cash, but have plenty produce if they could sell it.

SCOTT.—1, none; 2, none; 3, no special law; 4, (a) four, (b) P. Hagan, M. J. McConnell, C. P. Carter, and Ira Robinett; (c) cattle; 5, hogs suffered from cholera; the extent of the loss from said disease was nearly one-half of the hogs in the county; 6, no; 7, comparatively none; 8, it has not; 9, the whole; 10, no peas in the county; 11, no; 12, —; 13, (a) now being used with good results, (b) \$10, (c) it has, (d) corn and wheat; 14, (a) no, (b) —; 15, —; 16, (a) abundant, (b) —; 17, medium.

SHEANDOAH.—1, none; 2, none; 3, —; 4, (a) —, (b) James Cox, R. J. Walker, William H. Sheetz; (c) standard-bred horses, hogs, and cattle; 5, no; 6, 75 cents; 7, no; 8, yes, very damaging in some sections; 9, —; 10, —; 11, very few; 12, none raised; 13, (a) generally used, with good results; (b) \$18, (c) no, (d) wheat; 14, (a) none; (b) —; 15, large quantities; 16, (a) abundant, (b) —; 17, generally fair.

SMYTH.—1, no; 2, none; 3, no; 4, (a) none exclusively, (b) —, (c) —; 5, no; 6, no; 7, no; 8, no; 9, but little planted; 10, none; 11, no; 12, very little raised; 13, (a) considerable; good results; (b) \$12 50, (c) yes, (d) corn, wheat, and meadows; 14, (a) no, (b) —; 15, a large quantity of excellent butter is made; 16, (a) three rivers and several creeks, affording excellent water power; (b) couldn't say; 17, generally good.

SOUTHAMPTON.—1, none; 2, none; 3, five-foot fence; 4, (a) one, (b) F. E. Williams, Pope postoffice, Va.; (c) horses; 5, no; 6, yes, females, \$1; males, 50 cents; 7, lice have damaged cotton to some extent; 8, slightly; peanuts suffered; 9, none planted; 10, acreage increasing yearly; 11, no; 12, very successfully;

13, (a) generally used, with good results; (b) \$20 to \$25, (c) yes, (d) cotton and peanuts; 14, (a) no, (b) —; 15, only for home consumption; 16, (a) only that from ponds, (b) —; 17, generally good.

SPOTSYLVANIA.—1, none; 2, one shoe factory and one wheel and rim factory; 3, yes, in a portion of the county a man's line is his fence; 4, (a) six, (b) L. J. Graves, Mrs. B. A. Graves, U. S. Gay, O. P. Reynolds, John C. Segar, and M. B. Rowe; (c) Devon, Ayrshire, Jersey, and Guernsey cattle; 5, have heard of none; 6, no; 7, potato beetle has been unusually destructive; 8, long and serious drought in several sections of the county; 9, very small; 10, not raised; 11, not raised; 12, only raised by a few; 13, (a) about a thousand tons a year, (b) about \$20, (c) it has very much increased, (d) wheat, corn, and vegetables; 14, (a) one Grange club, (b) Clifton Grange, A. J. Dare, secretary; 15, this county sends to market about 40,000 pounds of butter annually; 16, (a) abundant, (b) —; 17, fairly good.

STAFFORD.—1, none; 2, none; 3, partially; each man provides for his stock; 4, (a) six, (b) William A. Little, Sr., Dr. G. M. Wallace, J. B. Gray, L. M. Honey, William E. Brooks, Captain D. M. Lee; (c) horses, cows, sheep, and hogs; 5, no; 6, no; 7, yes, to some extent; 8, three very disastrous; 9, about one-half; 10, small; 11, no; 12, some few farms raise it; 13, (a) largely used, with fairly good results; (b) can't say, (c) yes, (d) grass and wheat; 14, (a) none, (b) —; 15, considerable; 16, (a) abundant, (b) —; 17, good; most of our farmers are out of debt.

SURRY.—1, none; 2, none; 3, (a) no fence law in one district—a dividing fence between that and the other districts, which are fence districts; 4, none; 5, much hog cholera, some murrain in cattle; 6, none; 7, no special damage; 8, dry weather all through April, May, and June damaged early crops and corn considerably; 9, none raised; 10, considerable; 11, yes, quite largely and successfully; 12, limited extent; 13, (a) largely used, results variable but generally satisfactory; (b) \$22, (c) yes, (d) corn and trucks; 14, no; 15, very limited and only for local market; 16, numerous swampy streams supply ample water power; 17, fair to good—many are quite poor, but some are in quite easy circumstances, a few have bank accounts.

TAZEWELL.—1, coal; 2, none; 3, none; 4, (a) twelve or fifteen, (b) J. O. Huff, R. Lawson, Joe Moss, B. Higginbotham, A. St. Clair, Clinton Barnes, and others; (c) cattle, horses, and sheep; 5, no; 6, no; 7, to no extent; 8, yes, and it affected the hay and corn crops considerably; 9, 85 per cent.; 10, none; 11, none; 12, none raised; 13, (a) small extent, (b) \$17, (c) yes, (d) wheat and corn; 14, none; 15, to the largest extent possible; 16, (a) good, (b) immense power; 17, generally good.

WARREN.—1, none; 2, stove factory at Riverton; 3, —; 4, none breeding blooded stock exclusively; 5, there has been a good deal of distemper among horses; 6, \$1 one dollar on males, \$2 on females; 7, no; 8, the hay and potato crops were damaged by the dry weather; 9, none raised; 10, none raised; 12, none raised; 13, (a) generally used on wheat and corn with good results, (b) \$14 to \$27, (c) it has very materially, (d) wheat, corn, and grass; 14, none; 15, very limited; 16, the north and south branches of the Shenandoah; 17, fairly good for the times.

WARWICK.—1, none; 2, none; 3, every man's line a lawful fence; 4, (a) two, (b) D. S. Jones, Morrisons, and P. H. Wright, Mulberry Island; (c) standard-bred

trotters ; 5, some have lost cattle from lung trouble ; 6, we have a dog law but it is not enforced ; 7, not to any extent ; 8, the drought in July cut corn short ; 9, — ; 10, small ; 11, most farmers raise their seed from the second crop ; 12, to a very small extent ; 13, its use is on the increase and generally with good results, (b) \$30, (c) yes, the farmers are awakened to its value and are endeavoring to make all they can ; (d) potatoes and corn ; 14, none ; 15, very little made for sale ; 16, limited ; 17, very good—can pay their debts and buy what they want, as a rule.

WASHINGTON.—1, none ; 2, none ; 3, a three-wire or three-plank fence is all that is required ; 4, none wholly devoted to breeding blooded stock ; 5, no ; 6, none ; 7, no damage to crops ; 8, no drought—fine season ; 9, 95 per cent. ; 10, none ; 11, no ; 12, not raised ; 13, (a) fertilizers are generally used for wheat and tobacco quite successful, (b) \$20 to \$25, (c) farmers are becoming more particular in saving manure, (d) wheat, corn, and meadows ; 14, none ; 15, a considerable quantity is produced ; 16, well provided with water power ; 17, pretty fair, I think—not much in debt.

WESTMORELAND.—1, none ; 2, one canning factory ; 3, one township has the natural boundary a lawful fence, the other two still adhere to the old law, 5 feet ; 4, (a) two or three, (b) J. E. R. Crabbs and son, (c) horses, cattle, and sheep ; 5, no ; 6, none ; 7, no ; 8, slight ; 9, not a tobacco section ; 10, quite small, mostly for fallow ; 11, to a small extent and with little success ; 12, it has been recently introduced with gratifying success ; 13, (a) to a very large extent—results good where followed by grass, otherwise leaves the farmer in debt ; (b) \$22, (c) yes, (d) corn, wheat, and clover ; 14, none ; 15, very limited ; 16, sufficient to run several grist mills ; 17, solid—no money—farms being improved.

WISE.—1, no ; 2, furniture, door and sash factory at Coeburn ; 3, no ; 4, none ; 5, no ; 6, no ; 7, no ; 8, we have had a remarkably wet summer ; 9, not grown ; 10, none raised ; 12, not raised here ; 13, (a) to a considerable extent and with good results, (b) —, (c) yes, (d) corn, wheat, and garden crop ; 14, no ; 15, in large quantities ; 16, (a) sufficient to drive all the machinery in the State, (b) 500 ; 17, better than for years—they are getting out of debt and are living more within their means than before.

WYTHE.—1, none ; 2, none ; 3, none ; 4, (a) one, (b) Miss Sallie Ogesby, (c) short horn cattle ; 5, no ; 6, no ; 7, no more than usual ; 8, very much, considerable damage to grass and corn ; 9, — ; 10, — ; 11, no ; 12, none ; 13, (a) to a great extent with good results, (b) \$16, (c) yes, (d) — ; 14, (a) yes, (b) don't know ; 15, to a limited extent ; 16, (a) very good, (b) — ; 17, not very encouraging.

YORK.—1, none ; 2, one crab-packing factory ; 3, three rails, boards, or wires—in Grafton District hogs run out yet ; 4, (a) perhaps two, (b) not given, (c) not given ; 5, not to any extent ; 6, no ; 7, potato bugs caused some slight damage ; 8, the corn crop was injured somewhat by the dry weather ; 9, — ; 10, some black peas sowed in corn ; 11, yes, quite successful last year ; 12, to a small extent, success fair ; 13, (a) extensively used for early Irish potatoes, results good ; (b) \$37 50, (c) yes, (d) potatoes ; 14, no ; 15, small extent ; 16, very little—three ponds suited for small grist mills ; 17, very much behind—due to low price of potatoes and early peas—these crops are extensively raised here.

ASSAYS OF MINERALS

MADE BY THE

VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE, BLACKSBURG, VA., FOR THE DEPARTMENT OF AGRICULTURE,
UNDER ACT OF ASSEMBLY, 1891-'92.

COMPLETE ANALYSES.

No 101—Specimen of red clay from Charles E. Stoford, Giles county :

Moisture (at 212°F.).....	7.26	per cent.
Combined water, &c. (loss on ignition).....	8.98	"
Insoluble residue (silica and silicates).....	63.81	"
Ferric oxide.....	10.44	"
Aluminum oxide.....	3.26	"
Calcium oxide.....	1.46	"
Magnesium oxide.....	.30	"
Carbonic acid (combined).....	trace.	
Alkalies	undetermined.	
Total.....	95.51	per cent.

No. 102—Specimen of yellow clay from Charles E. Stoford :

Moisture (at 212°F.).....	.44	per cent.
Combined water, &c. (loss on ignition)	3.77	"
Insoluble residue (silica and silicates).....	75.50	"
Ferrous oxide.....	7.58	"
Aluminum oxide.....	6.97	"
Calcium oxide .....	.62	"
Magnesium oxide	1.48	"
Alkalies	undetermined.	
Total.....	96.36	per cent.

No. 103—Specimen of red clay from Charles E. Stoford :

Moisture (at 212°F.).....	10.17	per cent.
Combined water, &c. (loss on ignition).....	8.75	"
Insoluble residue (silica and silicates)....	63.81	"
Ferric oxide.....	13.75	"
Aluminum.....	.86	"
Calcium.....	1.19	"
Magnesium.....	.52	"
Carbon dioxide (combined).....	trace.	
Alkalies.....	undetermined.	
Total.....	99.05	per cent.

No. 104—Specimen of limestone from H. D. Ribble, Blacksburg, Va. :

Insoluble residue.....	.53	per cent.
Iron and aluminum oxides.....	.38	"
Calcium carbonate.....	56.82	"
Magnesium carbonate.....	42.00	"
Phosphoric acid.....	trace.	
Total.....	99.73	"
Lime equivalent—		
Magnesia equivalent—		

No. 105—Specimen of clay from ——— Saunders, Rocky Mount :

Moisture (at 212°F.).....	2.61	per cent.
Combined water, &c. (loss on ignition).....	10.59	"
Silica.....	49.00	"
Aluminum oxide.....	28.13	"
Iron pyrites.....	3.09	"
Ferrous oxide.....	2.88	"
Calcium oxide.....	.77	"
Magnesium oxide.....	.37	"
Alkalies.....	2.56	"
Total.....	100.00	"

No. 106—Specimen from Commissioner of Agriculture :

Moisture (at 212°F.).....	4.65	per cent.
Combined water, &c. (loss on ignition).....	5.11	"
Silica.....	75.14	"
Ferrous oxide.....	8.32	"
Aluminum oxide.....	5.95	"
Calcium oxide.....	trace.	
Magnesium oxide.....	"	
Carbonic acid (combined as carbonate).....	"	
Total.....	99.17	"

No. 107—Specimen of iron ore from F. M. Moss :

Moisture (at 212°F.).....	.55	per cent.
Combined water, &c. (loss on ignition).....	10.31	"
Insoluble residue.....	11.37	"
Ferric oxide.....	72.10	"
Aluminum oxide.....	large trace.	
Manganic oxide.....	2.61	per cent.
Calcium oxide.....	trace.	
Sulphur (as sulphate).....	.42	"
Phosphoric oxide.....	2.32	"
Total.....	99.68	"

Phosphorus, equivalent to—

Phosphoric oxide	1.01	per cent.
Sulphur, equivalent to sulphuric oxide .....	.17	"
Iron (metallic), equivalent to ferric oxide.....	50.47	"
Manganese (metallic), equivalent to manganic oxide.....	1.82	"

No. 108—Specimen of manganese ore from F. M. Moss, Burke's Garden :

Moisture (at 212°F.).....	.29	per cent.
Combined water, &c.....	12.41	"
Residue, insoluble in hydrochloric acid.....	4.79	"
Manganese dioxide.....	64.70	"
Manganous oxide.....	14.83	"
Ferrous oxide.....	2.05	"
Barium oxide.....	trace.	
Soluble sulphate.....	trace.	
Phosphoric oxide.....	.73	"
Total.....	99.80	"

Total metallic manganese equivalent to—

Manganic and manganous oxides.....	52.39	per cent.
Phosphorous, equivalent to phosphoric oxide.....	.32	"
Metallic iron, equivalent to ferrous oxide.....	1.60	"

No. 109—Specimen of "clay" from E. A. Morrison :

Moisture (at 212°F.).....	4.80	per cent.
Combined water, &c (loss on ignition).....	4.56	"
Silica.....	82.73	"
Aluminum oxide.....	3.51	"
Ferric oxide.....	3.82	"
Calcium oxide.....	.41	"
Magnesium oxide.....	.04	"
Total.....	99.87	"

No. 110—Specimen of clay from — Shelton, Nelson county :

Moisture (at 212°F.).....	.73	per cent.
Combined water, &c. (loss on ignition).....	5.08	"
Silica.....	69.34	"
Aluminum oxide.....	19.97	"
Ferric oxide.....	1.50	"
Calcium oxide.....	trace.	
Magnesium oxide.....	none.	
Alkalies.....	3.38	"
Total.....	100.00	"

PARTIAL ANALYSES—COMMERCIAL.

No. 111—Specimen of iron ore from R. B. Linkous, Blacksburg :

Moisture (at 212°F.).....	1.34	per cent.
Combined water, &c. (loss on ignition).....	10.95	"
Insoluble residue.....	13.82	"
Ferric oxide.....	70.77	"
Sulphuric oxide (combined).....	.11	"
Phosphoric oxide.....	1.95	"
Metallic iron, equivalent to ferric oxide.....	49.54	"
Sulphur, equivalent to sulphuric oxide.....	.044	"
Phosphorous, equivalent to phosphoric oxide.....	.85	"

No. 112—Specimen of zinc ore from R. B. Linkous :

Insoluble residue.....	2.91	per cent.
Metallic iron.....	3.91	"
Metallic zinc.....	24.13	"

No. 113—Specimen from Harvey Young, Yokum's station :

Insoluble residue.....	42.21	per cent.
Manganic oxide.....	3.07	"
Aluminum oxide.....	14.10	"
Ferric oxide.....	24.01	"
Manganese, equivalent to manganic oxide.....	2.14	"
Iron, equivalent to ferric oxide.....	16.81	"

No. 114—Specimen of lead ore from R. B. Linkous :

Insoluble matter.....	1.21	per cent.
Metallic lead (equivalent).....	50.00	"
Metallic zinc.....	trace.	

No. 115—Specimen of iron ore from O. L. La Rue :

Moisture (at 212°F.).....		
Silica (insoluble residue).....	13.83	per cent.
Manganese.....	none.	
Calcium oxide.....	trace.	
(Calculated) ferric oxide.....	90.24	"
Iron (metallic), equivalent to ferric oxide.....	63.17	"

DRY ASSAYS.

No. 116—Specimen from Harvey Young, contains no silver.

No. 117—Specimen of galena from J. A. Calfee, contains trace of silver (less than one ounce to the ton).

No. 118—Specimen of galena from Mr. Linkous :

Silver.....	.72	oz. per ton.
Zinc.....	trace.	

MINERALS DETERMINED FOR COMMISSIONER OF AGRICULTURE.

No. 119—Mixture of calcium phosphate and rutile.

No. 120—Titanium compound.

No. 121—Silicate of the ordinary earth metals, contains no useful metal.

No. 122—Same as No. 119.

No. 123—Specimen of iron pyrites and magnetic oxide.

R. C. PRICE,
Analyst.

WEATHER REPORT.

Compiled from the Reports of the Virginia State Weather Service, co-operating with the State Board of Agriculture, from October 1, 1893, to September 30, 1894.

OCTOBER.

During the month of October the temperature has averaged slightly below the normal throughout the State. The warmest periods were on the 9th and 24th and 25th. The coldest periods were the 16th to 19th and 30th and 31st, with freezing temperature on the latter dates, except on the coast.

The amount of rainfall over the State during the month of October averaged about one and a half inches above the normal, but ranged from only about two inches on the coast to over twelve inches in a portion of Nelson county. It was generally below the normal in the coast region and was heaviest in the middle Piedmont section. Light rains occurred on the 1st; general rains on the 4th and 5th; general and excessive rains on the 13th and 14th; heavy general rains on the 20th to 23d, and moderate general rains on the 27th and 28th.

NOVEMBER.

During the month of November the temperature has averaged about two degrees daily below the normal. The warmest periods were the 2d to 4th, the 13th, 18th, and 29th and 30th. The coldest periods were the 1st, and 24th to 27th.

The amount of rainfall averaged nearly twice the normal for November near the coast and above the normal throughout the Tidewater section, decreasing further westward to less than half the normal. It ranged from 8.11 inches at Cape Charles to 0.73 inch at Blacksburg. The periods of rainfall were the 4th and 5th, 7th to 9th, 14th and 15th, 19th, 21st and 22d, and 27th and 29th; on the 7th and 8th the rainfall was excessively heavy over the eastern portion of the State.

DECEMBER.

TEMPERATURE (degrees). Average monthly mean, 40.8; highest monthly mean, 48.1, at Cape Henry; lowest monthly mean, 35.3, at Hot Springs; maximum temperature, 83, at Avon, on the 24th; minimum temperature, 7, at Fredericksburg, on the 6th; greatest local monthly range, 71, at Avon; least local monthly range, 42, at Cape Charles and Hampton; average local monthly range, 52.3; greatest average daily range, 33.3, at Avon; least average daily range, 15.3, at Bedford City; mean average daily range, 21.6.

Average daily departure from the normal temperature for the month of Decem-

ber : At Norfolk, 1.2 degrees above ; at Lynchburg, 1.7 degrees above ; at Washington, D. C., 0.6 degrees above. The warmest periods were the 12th, 15th and 16th, 22d to 24th, and 28th and 29th. The coldest periods were the 4th to 6th, 8th and 9th, 14th, 18th to 21st, and 24th.

PRECIPITATION (inches). Average (from 40 stations) total monthly precipitation, 2.09 ; greatest monthly, 4.80, at Birdsnest ; least monthly, 0.54, at Dale Enterprise ; greatest amount in 24 consecutive hours, 1.60, at Spottsville, on the 16th.

Departure from the normal precipitation for the month of December : At Norfolk, 0.67 inch below ; at Lynchburg, 1.44 inches below ; at Washington, D. C., 0.70 inch below.

The number of days on which 0.01 inch, or more, of precipitation (rainfall, or melted snow, or sleet) occurred, averaged 6 (for 40 stations), and ranged from 3 to 12.

There were an average of 15 clear days, 7 partly cloudy days, and 9 cloudy days. The amount of rainfall was below the normal throughout the State, but only slightly below in the Eastern section, generally decreasing westward, and ranged from 4.80 inches, at Birdsnest, to only 0.54 at Dale Enterprise.

The periods of rainfall were 2d to 5th, 9th, 14th to 16th, and 28th to 31st.

JANUARY.

TEMPERATURE (degrees). Average monthly mean, 40.1 ; highest monthly mean, 45.8, at Cape Henry ; lowest monthly mean, 35.6, at Hot Springs ; maximum temperature, 73, at Avon, on the 5th ; minimum temperature, 8, at Big Stone Gap, on 24th and 25th ; greatest local monthly range, 52, at Avon ; least local monthly range, 33, at Cape Charles ; greatest average daily range, 29.3, at Avon ; least average daily range, 12.5, at Hampton ; mean average daily range, 18.3.

Average daily departure from the normal temperature for month of January : At Norfolk, 3.5 degrees above ; at Lynchburg, 3.8 degrees above ; at Washington, D. C., 5.1 degrees above. The month was generally mild and the temperature average three to five degrees, daily, above the normal. The warmest periods were on the 5th and 6th, 14th to 16th, 22d to 24th, and 31st ; the coldest periods were the 2d, 13th, and 24th to 28th.

PRECIPITATION (inches). Average (from 39 stations) total monthly precipitation, 2.29 ; greatest monthly, 3.86, at Birdsnest ; least monthly, 0.94, at Stephens City ; greatest amount in 24 consecutive hours, 1.48, at Bedford City, on the 29th.

Departure from the normal precipitation for the month of January : At Norfolk, 0.34 inch below ; at Lynchburg, 2.07 inches below ; at Washington, D. C., 1.22 inches below. The amount of precipitation was only slightly below the normal on the coast and in the Southeastern section, but was only about half the normal in the Middle section, and still less in the Western portion.

The periods of precipitation were local and general rains from the 5th to 11th ; 15th and 16th, 20th to 22d, 24th to 27th, and 29th and 30th.

The number of days on which 0.01 inch or more of precipitation (rainfall or melted snow) occurred, averaged 9, and ranged from 4 at Avon, to 14 at Richmond and 15 at Abingdon.

There was an average of 11 clear days, 7 partly cloudy days, and 13 cloudy days. The snowfall was generally light, and did not afford much or any protection to winter crops.

FEBRUARY.

TEMPERATURE (degrees). Average monthly mean, 38.5; highest monthly mean, 43.0, at Cape Henry; lowest monthly mean, 33.6, at Hot Springs; maximum temperature, 74, at Richmond on the 9th, and at Norfolk on the 10th; minimum temperature, 7, at Hot Springs and at Warsaw, on the 25th; greatest local monthly range, 62, at Warsaw; least local monthly range, 47, at Cape Charles; average local monthly range, 52.2; greatest average daily range, 24.9, at Avon; least average daily range, 13.0, at Alexandria; mean average daily range, 18.6.

Average daily departure from the normal temperature for month of February: At Norfolk, 0.9 degrees below; at Lynchburg, 0.8 degrees below; at Washington, D. C., 0.9 degrees below. These indicate the average over the State was about one degree, daily, below the normal. The warmest periods occurred on the 1st, 8th and 9th, and 18th and 19th. The coldest periods were the 2d, 4th to 7th, 16th and 17th, and 24th to 28th. The 25th was generally the coldest day of the season.

PRECIPITATION (inches). Average (40 stations) total precipitation during February, 4.37; greatest monthly, 7.50, at Birdsnest; least monthly, 2.25, at Christiansburg; greatest amount in 24 consecutive hours, 2.75, at Birdsnest on the 25th. The above amounts include snowfall melted.

Departure from the normal precipitation for the month of February: At Norfolk, 1.85 inches above; at Lynchburg, 1.43 inches above; at Washington, D. C., 1.33 inches above. The amount for the month was slightly below the normals in a few localities in the Southwest, but generally averaged from one to two inches, or nearly one-third, above the normal.

The periods of rain or snow were the 3d and 4th, 8th and 9th, 12th to 15th, 18th, 21st and 22d, and 25th and 26th, with general heavy snow on the two latter dates.

The number of days on which 0.01 inch or more of precipitation occurred, averaged 10, and ranged from 6, at Wytheville, to 15 at Clarksville, Norfolk, and Washington, D. C.

There was an average of 9 clear days, 7 partly cloudy days, and 12 cloudy days.

The snowfall generally afforded very little protection to winter crops, as even the heavy snow of 25th drifted badly, and was followed by higher temperature that melted it rapidly.

MARCH.

TEMPERATURE (degrees). Average monthly mean, 49.9; highest monthly mean, 53.6, at Richmond; lowest monthly mean, 45.2, at Hot Springs; maximum temperature, 92, at Richmond on the 22d; minimum temperature, 9, at Hot Springs on 28th; greatest local monthly range, 77, at Richmond; least local monthly range, 59, at Cape Henry and Birdsnest; average local monthly range, 66.7; greatest average daily range, 32.9, at Big Stone Gap; least average daily range, 17.2, at Hampton; mean average daily range, 24.4.

Average daily departure from the normal temperature for month of March: At Norfolk, 5.5 degrees above; at Lynchburg, 6.5 degrees above, and at Washington, D. C., 7.2 degrees above. These indicate that the average for the State was about six degrees, daily, above the normal for March. The warmest periods occurred on the 5th to 7th, 11th, 18th to 23d, and 31st. On the 19th and 22d the temperature was generally higher, by three to five degrees, than ever previously recorded

during March since the establishment of the National Weather Service, though in 1871 and 1878 the average for the month was generally slightly higher than this March. The coldest periods were the 1st to 4th, and 26th to 28th, with the lowest temperature generally on the 28th. During the cold wave of 26th to 28th the temperature was generally lower than ever previously recorded for the time of year, and, following the protracted and unusual warm weather, caused very great damage to all growing crops and destroyed nearly all early fruit.

PRECIPITATION (inches). Average (40 stations) total precipitation during March, 1.44; greatest monthly, 3.15, at Birdsnest; least monthly, 0.33, at Christiansburg.

Departure from the normal precipitation for the month of March: At Norfolk, 1.64 inches below; at Lynchburg, 2.90 inches below; at Washington, D. C., 3.22 inches below. The amount for the month was generally about half the normal in the Tidewater section, and only about one-fourth to one-third over the other sections. There were only occasional light local rains during the first half of the month; generally moderate rains about the 17th, 21st to 23d, 25th, and 29th.

The number of days on which 0.01 inch or more of precipitation occurred averaged only 6, and ranged from 12 at Cape Henry to 2 at Avon, Bedford City, and Buchanan.

There were an average of 17 clear, 8 partly cloudy, and 6 cloudy days.

APRIL.

TEMPERATURE (degrees). Average monthly mean, 54.1; highest monthly mean, 57.1, at Richmond; lowest monthly mean, 48.1, at Hot Springs; maximum temperature, 92, at Richmond, on the 28th; minimum temperature, 19, at Dale Enterprise and Hot Springs, on 8th; greatest local monthly range, 69, at Avon; least local monthly range, 43, at Cape Charles and Cape Henry; average local monthly range, 56.0; greatest average daily range, 32.4, at Big Stone Gap; least average daily range, 14.8, at Cape Henry; mean average daily range, 23.3.

Average daily departure from the normal temperature for the month of April: At Norfolk, 0.3 degrees below; at Lynchburg, 0.4 degrees below; at Washington, D. C., 0.3 degrees below. These indicate that the average for the State was about, or only very slightly below, the normal. The warmest periods occurred about the 16th to 20th, and 26th to end of the month, but the temperature was not excessively high on any day. The coldest period occurred on 1st to 3d, 6th to 13th, and 22d to 25th.

PRECIPITATION (inches). Average (40 stations) total precipitation during April, 2.38; greatest monthly, 4.20, at Birdsnest; least monthly, 0.75, at Christiansburg.

Departure from the normal precipitation for the month of April: At Norfolk, 2.03 inches below; at Lynchburg, 1.65 inches below; at Washington, D. C., 0.18 inches above. The amount for the month was generally about the normal over the northern sections, the greater portion of the Tidewater section, and the extreme Southwest, but averaged only about half the normal amount in the interior and other sections. The periods of precipitation were the 1st, 2d, 4th, 10th and 11th, 20th to 22d, and 27th to 29th.

The number of days on which 0.01 inch, or more, of precipitation occurred averaged only 6, and ranged from 15, at Big Stone Gap, to 4, at Houston.

There were an average of 13 clear, 9 partly cloudy, and 8 cloudy days.

MAY.

TEMPERATURE (degrees). Average monthly mean, 66.2; highest monthly mean, 69.9, at Richmond; lowest monthly mean, 60.4, at Blacksburg and Hot Springs; maximum temperature, 98, at Richmond, on the 18th; minimum temperature, 30, at Hot Springs, on the 29th; greatest local monthly range, 61, at Petersburg; least local monthly range, 42, at Hampton; average local monthly range, 51.3; greatest average daily range, 28.8, at Richmond; least average daily range, 16.1, at Hampton; mean average daily range, 23.6.

Average daily departure from the normal temperature during the month of May: At Norfolk, 3.5 degrees above; at Lynchburg, 1.5 degrees above; at Washington, D. C., 2.2 degrees above. The temperature at the central station (Lynchburg) was above normal from 1 to 15 degrees every day until, and including, the 18th, and from the 19th to 31st it was below the normal from 2 to 15 degrees, except on the 28th it was normal. The warmest periods were the 2d to 4th, 7th and 8th, and 16th to 18th. The coldest periods were on the 1st, 20th and 21st, and the 28th and 29th.

PRECIPITATION (inches). Average (45 stations) total precipitation during May was 3.99; greatest monthly, 8.11, at Stephens City; least monthly, 2.31, at Wytheville.

Departure from the normal precipitation for the month of May: At Norfolk, 0.56 inch below; at Lynchburg, 0.91 inch above; at Washington, D. C., 0.13 inch above. The amount for the month averaged about the normal; it was generally heaviest in the northern counties of the State, especially in Frederick, Clarke, and Loudoun counties. While there were numerous local showers during the first half of the month, yet, on account of the deficiency during April, the drought became quite severe over the greater portion of the State, except the extreme northern, so that all growing crops were seriously injured and corn planting delayed until general and heavy rains on the 18th to 20th. Local rains occurred on the 2d, 4th to 6th, and scattered local showers from 11th to 17th, and general and heavy rains 18th to 20th, and local rains 22d to 24th, 27th and 28th, and 30th and 31st. The greatest amount of rainfall during twenty-four consecutive hours was 4.65 inches at Stephens City, on 18th and 19th. The following stations reported 2.00 inches or more in twenty-four consecutive hours: Alexandria, 2.36 inches, on 17th and 18th; Ashland, 2.00, on 19th; Bedford City, 2.04, on 19th; Dale Enterprise, 2.20, on 19th; Irwin, 2.00, on 19th; Lynchburg, 2.28, on 18th and 19th; Petersburg, 3.46, on 19th; Richmond, 2.64, on 19th; Stephens City, 4.65, on 18th and 19th; Warrenton, 2.32, on 19th, and Riverton, 3.38, on 19th.

The number of days on which 0.01 inch, or more, of precipitation occurred averaged 11, and ranged from 7 at Bedford city and Buchanan to 18 at Big Stone Gap. Wytheville and Marion reported light snow on the 19th.

There were an average of 13 clear, 11 partly cloudy, and 7 cloudy days.

JUNE.

TEMPERATURE (degrees). Average monthly, 73.2; highest monthly mean, 76.6, at Richmond; lowest monthly mean, 63.9, at Hot Springs; maximum temperature, 106, at Richmond on the 23d; minimum temperature, 33, at Big Stone Gap on the

1st, and at Graham's Forge on the 7th; greatest local monthly range, 64, at Whittle's Depot; least local monthly range, 40, at Birdsnest and at Smithville; average local monthly range, 52.5; greatest average daily range, 35.4, at Hot Springs; least average daily range, 14.8, at Smithville; mean average daily range, 25.8.

Average daily departure from the normal temperature during the month of June: At Norfolk, 1.4 degrees above; at Lynchburg, 0.1 degrees above; at Washington, D. C., 2.1 degrees above. The coldest periods were on the 1st and 6th and 7th, when light frosts occurred in some sections of the Southwest. The warmest periods were the 4th, 10th to 13th, 16th and 17th, and from the 20th to the end of the month, the highest temperature occurring on the 23d and 24th and 29th.

PRECIPITATION (inches). Average (of 44 stations) total precipitation during June was 2.10; greatest monthly, 5.40, at Richmond; least monthly, 0.51, at Danville.

Departure from the normal precipitation for the month of June: At Norfolk, 0.91 inches below; at Lynchburg, 2.35 inches below; at Washington, D. C., 3.05 inches below.

The amount of rainfall during the month for the entire State only averaged slightly above half the normal rainfall during June, though in some localities the amount was above normal, due to heavy local thunder storms. There were light to heavy general rains on the 5th and 6th; occasional local showers about the 12th and 13th; light to heavy local rains, extending over the greater portion of the State, from the 17th to 20th; and local showers again from the 25th to 30th. But after the 6th the rains were in the character of thunder showers which were so local that portions of one county would often have no rain while other portions would be well favored. By the end of the month the drought was becoming quite general, and especially in the central section, where wheat, oats and grass were seriously cut short and corn retarded and injured, and tobacco retarded or even killed in some sections.

The number of days on which 0.01 inch, or more, of precipitation occurred, averaged 6, and ranged from 11 at Abingdon to 2 at Alexandria.

There was an average of 17 clear, 9 partly cloudy, and 4 cloudy days.

JULY.

TEMPERATURE (degrees). Average monthly, 76.3; highest monthly mean, 80.1, at Richmond; lowest monthly mean, 66.8, at Hot Springs; maximum temperature, 102, at Richmond on the 13th and 14th; greatest local monthly range, 52, at Big Stone Gap and Fredericksburg; least local monthly range, 31, at Hampton; minimum temperature, 36, at Hot Springs on the 5th and 8th; monthly range, 42.9; greatest average daily range, 31.9, at Hot springs; least average daily range, 11.8, at Smithville; mean average daily range, 23.2.

Average daily departure from the normal temperature during the month of July: At Norfolk, 0.7 degrees below; at Lynchburg, 0.6 degrees below; at Washington, D. C., 0.4 degrees above. This shows that the temperature averaged very near the normal for the month. The hottest periods were about the 2d, 6th, 12th to 16th, 19th to 21st, and 25th to 29th. The coolest period was from the 7th to 12th.

PRECIPITATION (inches). Average (of 43 stations) total precipitation during July was 3.96; greatest monthly, 8.10, at Cape Charles (three last days not recorded); least monthly, 1.41, at Christiansburg.

Departure from the normal precipitation for the month of July: At Norfolk,

2.40 inches above; at Lynchburg, 1.18 inches above; at Washington, D. C., 2.51 inches below.

Greatest amount in twenty-four consecutive hours: 3.20 inches at Lynchburg, on 22d and 23d. The following stations report 2.00 inches, or more, in twenty-four consecutive hours: Birdsnest, 2.50 on 21st, and 22d; Cape Charles, 3.10, on 21st; Irwin, 3.00, on 22d; Lexington, 2.20, on 22d; Lynchburg, 2.75 inches in seventy-five minutes on 22d; Marion, 2.00, on 22d and 23d; Norfolk, 2.53 on 7th; Warsaw, 2.20, on 22d and 23d; Buchanan, 2.30, on 22d.

The amount of rainfall during the month for the entire State has averaged about the normal, but varied from fifty per cent above near the coast to fifty to sixty per cent below the normal in portions of the Southwest, Middle, the Valley, and northern section, and was very unevenly distributed. Light to heavy local showers occurred throughout the State the 1st to 3d, and 5th and 6th, that somewhat relieved the drought wherever they occurred; local showers from the 14th to 17th were more scattered; general light to heavy rains from the evening of the 20th to the 24th proved very beneficial, and, followed by local showers on 25th and 26th, and light to heavy local rains the 29th to 31st, very effectually broke the drought, except in the middle West Virginia border counties, where only light rains occurred.

The number of days on which 0.01 inch, or more, of precipitation occurred, averaged 9, and ranged from 14 at Lynchburg to 3 at Buchanan.

There were an average of 15 clear, 10 partly cloudy, and 6 cloudy days.

AUGUST.

TEMPERATURE (degrees). Average monthly, 73.3; highest monthly mean, 76.0, at Nottoway; lowest monthly mean, 66.8, at Hot Springs; maximum temperature, 101, at Whittle's Depot on the 10th; average maximum temperature, 93.5; minimum temperature, 46, at Big Stone Gap on the 6th and 7th, at Dale Enterprise on 7th, and Hot Springs on 6th; average minimum temperature, 54.3; greatest local monthly range, 50, at Dale Enterprise; least local monthly range, 29, at Birdsnest; average local monthly range, 39.1; greatest average daily range, 28.5, at Dale Enterprise; least average daily range, 11.3, at Smithville; mean average daily range, 20.6.

Average daily departure from the normal temperature during the month of August: At Norfolk, 1.4 degrees below; at Lynchburg, 1.0 degrees below; at Washington, D. C., 0.5 degrees above. The temperature averaged slightly below the normal for the State. The hottest periods were the 1st to 3d, 8th to 10th, 12th to 13th, and 29th and 30th. The coolest periods were the 6th and 7th and 22d to 24th.

PRECIPITATION (inches). Average total precipitation during August was 3.41; greatest monthly, 9.99, at Hampton; least monthly, 1.03, at Hot Springs. (For comparative records see tables on pages 6 and 11).

Departure from the normal precipitation for the month of August: At Norfolk, 2.12 inches above; at Lynchburg, 1.47 inches below; at Washington, D. C., 2.44 inches below.

The following stations report 2.00 inches, or more, in twenty-four consecutive hours: Birdsnest, 2.00, on the 5th, and 2.75, on 11th and 12th; Hampton, 2.60, on 18th (2.44 inches of which fell in 40 minutes).

The amount of rainfall during August averaged about the normal for the State, but was unevenly distributed; it was generally from fifty to one hundred per cent

above the normal near the coast; was about normal throughout the southern tide-water section, and generally slightly below in the northern; it was generally thirty to fifty per cent below normal, thence to the Blue Ridge; and forty to sixty per cent below in the western and southwestern counties. Light to heavy rain occurred on the 1st, and 2d to 4th, (being quite general on the 3d): on 9th, and 10th to 13th (being general on 11th and 12th); local rain from 15th to 20th; 25th to 28th (general on 26th and 27th); and local rains on 31st. By the end of the month the drought was being felt again in the western and southwestern sections, and in some portions of the middle section.

The number of days on which 0.01 inch, or more, of precipitation occurred, averaged 8, and ranged from 14 at Nottoway and 13 at Lynchburg, to 4 at Stephen City and Rocky Mount, and 3 at Christiansburg.

There were an average of 10 clear, 12 partly cloudy, and 9 cloudy days. During the last week of the month the atmosphere presented a more or less smoky appearance, supposed to be caused by smoke from the prevailing forest fires in the Northwest.

SEPTEMBER.

TEMPERATURE (degrees). Average monthly, 70.7; highest monthly mean, 75.5, at Cape Henry; lowest monthly mean, 63.8, at Hot Springs; maximum temperature, 101, at Richmond on the 9th; minimum temperature, 36, at Hot Springs on the 25th; average maximum temperature, 93.1; average minimum temperature, 46.4; greatest local monthly range, 54, at Avon and at Whittle's Depot; least local monthly range, 31, at Hampton; average local monthly range, 46.4; greatest average daily range, 26.6, at Big Stone Gap; least average daily range, 11.7, at Hampton; mean average daily range, 19.8.

Average daily departure from the normal temperature during the month of September: at Norfolk, 3.2 degrees above; at Lynchburg, 2.2 degrees above; at Washington, D. C., 4.0 degrees above. These indicate that the average for the State would be about 3.0 degrees, daily, above the normal. The hottest periods were from the 7th to 10th, and on the 23d. The coolest periods were the 21st and 22d, and 25th to 27th, with occasional light frosts in the western part of State on 25th and 26th.

PRECIPITATION (inches). Average total precipitation during September, 4.32; greatest monthly, 8.15, at Petersburg; least monthly, 0.90, at Wytheville; greatest amount in 24 consecutive hours, 3.60 inches on the 27th—28th, at Birdsnest. (For comparative records, see tables on pages 6 and 10).

Departure from the normal precipitation for the month of September: At Norfolk, 1.63 inches above; at Lynchburg, 0.26 inches above; at Washington, D. C., 2.45 inches below.

The following stations report 2.00 inches, or more, in 24 consecutive hours: Ashland, 2.20, on 29th; Avon, 2.70, on 29th, 30th; Birdsnest, 3.60, on 27th, 28th; Buckingham, 3.30, on 29th; Cape Henry, 2.00, on 27th; Houston, 2.50, on 18th; Irwin, 2.00, on 30th; Nottoway, 3.24, on 30th; Petersburg, 2.46, on 18th, 19th; Richmond, 2.69, on 20th; Spottsville, 2.25, on 27th; Stanardsville, 2.10, on 18th; Whittle's Depot, 2.09, on 18th.

The amount of rainfall during September, for the State (average of 37 stations), was slightly above the normal for the month, but it was unevenly distributed, and nearly all occurred during the rainy period of the 16th to 20th, and 26th to 30th.

The drought in the western and southwestern sections, noted at end of August, continued and spread over all sections until the general rains of the 16th to 20th gave partial relief in the southwest, and nearly general relief in other sections, and gave farmers the chance to complete or begin fallowing and seeding, and revived the pasturer. Prior to the 16th only light local showers had occurred; the period from the 20th to 26th was dry and favorable for all farm work, and securing the tobacco and corn crops. Then followed general and heavy rains until the end of the month, which effectually broke up the drought in all sections.

The number of days on which 0.01 inch, or more, of precipitation occurred, averaged 5, and ranged from 12 at Dale Enterprise to 3 at Stanardville and Smithville. There were an average of 12 clear, 9 partly cloudy, and 9 cloudy days.

MONTHLY AND ANNUAL AVERAGE MAXIMUM TEMPERATURE, &c.—Continued.

MONTHS.	MONTHLY AND ANNUAL AVERAGE MAXIMUM TEMPERATURE, &c.—Continued.																	
	Lynchburg.	Marion.	Norfolk.	Notoway C. H.	Petersburg.	Richmond.	Rocky Mount.	Salem.	Saluda.	Spottsville.	Staunton.	Stephens City.	Warrenton.	Warsaw.	White's Depot.	Wytheville.	Washington, D. C.	AVERAGES.
October, 1893.....	66.2	62.7	68.3	70.3	69.7	70.6	.....	67.2	69.5	67.7	65.1	64.8	.....	66.7	.....	61.9	65.9	66.9
November, ".....	55.2	53.4	56.8	57.0	59.1	60.0	.....	56.1	58.1	56.7	53.1	50.8	.....	54.7	.....	51.4	51.7	55.0
December, ".....	52.1	48.9	52.7	53.6	56.5	54.3	.....	53.7	55.5	53.5	49.0	49.1	.....	50.8	.....	46.9	47.0	51.4
January, 1894.....	49.8	48.1	50.5	51.2	52.5	49.8	.....	51.5	51.5	50.2	46.5	47.5	.....	48.1	.....	46.1	44.4	49.1
February, ".....	48.6	48.2	50.3	52.1	51.8	52.7	.....	49.4	50.2	48.8	45.7	45.4	43.8	.....	47.1	44.4	42.6	47.7
March, ".....	64.0	61.7	61.8	66.4	65.8	68.7	.....	62.0	62.8	62.4	61.2	61.0	60.5	.....	60.8	59.2	58.5	62.1
April, ".....	66.0	64.1	64.3	69.0	69.0	71.9	74.2	65.1	66.1	66.5	66.3	64.5	64.2	68.3	64.6	61.7	62.3	66.0
May, ".....	78.2	75.6	78.7	82.8	81.2	84.3	79.4	76.0	81.1	81.3	77.6	77.7	79.3	73.2	79.9	81.4	75.7	78.0
June, ".....	86.7	83.5	84.7	90.1	88.0	91.8	88.7	83.9	.....	87.8	85.3	84.8	87.2	83.0	87.6	80.0	84.6	86.0
July, ".....	88.5	84.1	87.1	92.6	89.1	94.7	88.5	85.7	.....	89.3	87.5	86.9	89.3	86.8	90.4	92.5	79.8	87.8
August, ".....	84.7	81.6	81.9	88.5	84.7	86.5	85.4	84.8	.....	82.7	82.9	84.3	85.3	82.3	83.3	88.5	78.0	83.2
September, ".....	80.2	77.0	80.8	84.5	82.2	84.1	82.0	81.3	.....	80.3	79.9	79.3	80.8	.....	79.4	83.6	80.0	80.4
Averages.....	68.4	65.7	68.2	71.5	70.8	72.4	.....	68.1	.....	68.9	66.7	67.0	.....	67.8	.....	63.2	65.3	67.7

THE VIRGINIA STATE WEATHER SERVICE.

Monthly and Annual Average Minimum Temperature (degrees) for the 12 months ending September 30, 1894.

MONTHS.	Alexandria.	Ashland.	Avon.	Bedford City.	Big Stone Gap.	Blacksburg.	Buckingham.	Cape Charles.	Cape Henry.	Charlottesville.	Dale Enterprise.	Fredericksburg.	Graham's Forge.	Hampton.	Hot Springs.	Houston.	Irwin.	Lexington.
October, 1893	44.9	47.4	43.2	49.5	38.5	43.4	.....	52.7	55.8	45.7	48.2	44.1	.....	54.8	39.8	.....	47.0	41.2
November, "	34.1	36.7	30.3	38.8	27.6	27.5	.....	39.7	44.5	34.6	29.9	31.5	.....	42.9	30.1	.....	35.6	28.7
December, "	29.8	31.1	24.8	34.9	23.0	25.3	.....	33.1	40.2	31.7	26.3	27.7	.....	36.4	24.4	.....	31.1	24.2
January, 1894	31.7	32.7	26.6	33.2	25.6	26.6	.....	33.7	38.8	32.2	25.9	31.4	.....	36.9	25.4	.....	31.6	25.3
February, "	29.1	30.6	25.7	30.4	23.5	24.9	.....	32.1	35.0	29.5	23.9	29.8	.....	35.5	23.6	.....	30.8	25.1
March, "	40.1	39.9	31.7	40.0	30.3	32.9	.....	38.7	42.0	39.2	33.6	37.1	.....	43.0	31.5	.....	39.3	31.8
April, "	44.1	42.9	40.4	45.0	35.5	37.1	.....	41.3	47.0	44.2	37.9	42.2	.....	47.3	36.3	.....	43.0	37.3
May, "	57.5	56.5	52.0	55.9	45.5	47.3	57.3	.....	58.9	55.9	51.0	54.2	.....	61.5	47.2	.....	56.4	48.8
June, "	63.3	61.5	58.5	61.8	52.5	54.0	65.1	65.9	65.6	61.9	54.7	59.7	.....	66.9	46.2	.....	60.1	54.0
July, "	68.3	66.5	62.5	65.6	55.1	58.0	65.9	70.8	69.2	.....	59.7	66.1	.....	71.3	50.8	.....	66.5	61.0
August, "	65.7	63.6	60.5	64.2	56.2	57.8	63.7	65.9	68.2	.....	57.0	63.3	.....	68.7	53.9	.....	64.0	60.2
September, "	63.7	62.1	58.9	.....	53.2	55.6	60.7	66.1	68.2	.....	55.1	60.6	.....	68.8	52.6	.....	61.4	58.2
Averages.....	47.7	47.6	43.1	.....	38.9	40.9	.....	.....	52.8	.....	41.9	45.6	.....	52.9	38.5	.....	47.0	41.3

THE VIRGINIA STATE WEATHER SERVICE.

Monthly and Annual Average Mean Temperature (degrees) for the twelve months ending September 30, 1894.

MONTHS.		Alexandria.*	Ashland.*	Avon.*	Bedford City.*	Big Stone Gap.*	Birdsneest	Blacksburg.*	Buckingham.*	Cape Charles†	Cape Henry.*	Charlottesville.*	Dale Enterprise.*	Fredericksburg.*	Graham's Forge.*	Hampton.*	Hot Springs.*	Houston.*	Irwin.*	Lexington.*
October,	1893	55.4	59.2	56.6	57.2	52.8	60.4	53.8	.....	61.2	61.4	55.1	57.2	55.5	.....	61.8	52.2	.....	56.0	53.5
November,	"	43.4	47.3	46.0	46.8	41.1	49.2	40.7	.....	48.3	50.8	44.9	39.5	43.4	.....	49.6	40.9	.....	45.1	41.2
December,	"	38.6	43.2	41.4	42.6	35.6	43.7	37.2	.....	48.3	48.1	42.6	36.8	39.6	.....	44.6	35.3	.....	41.5	36.6
January,	1894	38.2	42.0	41.2	40.8	37.8	42.3	36.6	.....	42.4	45.4	40.8	36.4	39.7	.....	43.2	35.6	.....	40.0	37.0
February	"	35.6	40.2	38.2	39.1	35.8	40.4	34.6	.....	42.0	43.0	38.8	34.1	38.6	.....	42.3	33.6	.....	39.4	35.6
March,	"	49.8	53.0	49.4	51.2	46.8	50.8	46.2	.....	49.1	50.6	51.6	47.2	50.0	.....	51.6	45.2	.....	50.4	46.9
April,	"	53.6	56.1	55.6	55.8	51.7	53.8	49.0	.....	50.8	54.4	55.8	50.2	54.5	55.2	54.9	48.1	56.3	55.7	51.7
May,	"	67.2	67.4	65.8	66.2	61.5	68.1	60.4	65.2	68.3	67.8	68.0	63.2	67.3	63.0	69.5	60.4	67.2	67.5	63.4
June,	"	74.3	72.8	73.6	73.2	69.4	75.6	68.0	76.0	73.7	74.6	75.5	70.2	74.0	70.6	75.8	63.9	73.8	74.6	69.2
July,	"	78.8	77.1	76.8	76.0	70.2	79.1	70.7	77.8	76.4	77.4	.....	74.0	77.9	73.2	79.1	66.8	78.4	77.8	74.0
August,	"	75.6	73.0	73.0	72.8	69.7	74.5	68.8	72.8	74.8	75.0	.....	71.2	74.0	72.2	75.1	66.8	75.0	73.9	72.4
September,	"	72.6	71.3	70.6	.....	66.5	74.0	66.4	69.6	72.8	75.5	.....	66.7	71.4	67.5	74.6	63.8	71.7	70.1	69.7
Averages ..	.....	56.9	58.6	57.4	.....	53.2	59.3	52.7	.....	58.5	60.3	.....	53.9	57.2	.....	60.2	51.0	.....	57.7	54.3

MONTHLY AND ANNUAL AVERAGE MEAN TEMPERATURE, &c.—Continued.

* MONTHS.	Lynchburg.*	Marion.*	Norfolk.*	Notkaway.*	Petersburg.*	Richmond.*	Rocky Mount.*	Salem.*	Saluda.*	Spotsville.*	Standardsville.*	Staunton.*	Stephen's City.	Warrenton.*	Warsaw.*	White's Depot.*	Wytheville.*	Washington, D. C.*	AVERAGES.
October, 1893	56.7	51.8	61.8	57.6	57.9	58.6	.....	57.8	58.7	56.9	56.5	54.6	55.2	.....	57.0	.....	52.0	56.5	57.2
November, "	45.2	43.0	50.3	45.4	48.5	47.3	.....	45.7	48.2	46.6	44.1	42.9	41.5	.....	45.5	.....	41.2	43.5	45.1
December, "	41.8	37.1	45.0	41.2	44.2	41.2	.....	42.6	43.7	42.1	39.6	40.0	38.7	.....	40.8	.....	36.7	38.3	40.8
January, 1894	41.2	38.2	44.1	41.2	42.9	40.0	.....	42.1	42.8	41.0	38.8	39.8	38.0	.....	39.4	.....	36.9	37.8	40.1
February, "	40.1	37.8	42.8	41.4	42.4	46.8	.....	40.0	41.0	40.2	37.6	36.4	34.3	.....	38.4	.....	35.0	35.2	38.5
March, "	51.8	48.2	52.5	52.5	53.4	53.6	.....	51.1	51.4	51.0	50.3	48.4	47.6	.....	49.6	.....	47.5	48.5	49.9
April, "	55.6	42.0	55.8	56.3	56.6	57.1	59.5	55.2	64.3	54.6	56.2	52.6	52.4	57.3	54.4	.....	50.3	53.2	54.1
May, "	67.2	62.0	69.4	69.4	68.7	69.9	66.9	66.3	68.9	68.8	66.6	65.2	66.2	65.1	68.1	68.0	61.2	65.9	66.2
June, "	74.4	68.4	75.0	76.5	75.2	76.6	75.3	74.1	.....	74.8	72.8	71.7	73.3	71.2	75.4	75.4	68.8	73.7	73.2
July, "	77.2	71.6	78.4	79.4	78.2	80.1	76.6	76.6	.....	78.7	75.9	74.8	77.2	76.2	78.9	78.6	70.0	78.0	76.3
August, "	74.6	70.2	74.5	76.0	74.6	74.6	75.4	74.8	.....	73.4	72.5	72.9	73.8	73.1	73.6	75.6	69.0	74.0	73.3
September, "	71.2	66.0	74.4	73.1	72.8	73.1	72.2	72.6	.....	71.6	70.8	68.6	70.1	.....	70.6	72.2	65.8	71.4	70.7
Averages.....	58.1	53.9	60.3	59.1	59.6	59.4	.....	58.2	.....	58.3	56.8	55.7	55.7	.....	57.6	.....	52.9	56.3	70.7

* Mean of maximum and minimum temperatures.

† Mean of 7 A. M., 2 P. M., and 9 P. M. readings.

THE VIRGINIA STATE WEATHER SERVICE.

Total and Average Monthly and Annual Precipitation (inches and hundredths) for the twelve months ending September 30, 1894.

MONTHS.	Alexandria.	Ashland.	Avon.	Bedford City.	Big Stone Gap.	Birdsnest.	Blackburg.	Buckingham.	Cape Charles.	Cape Henry.	Charlottesville.	Dale Enterprise.	Falls Church.	Fredericksburg.	Graham's Forge.	Hampton.	Hot Springs.	Houston.	Irwin.	Lexington.	Lynchburg.	Marion.	Norfolk.	Nottoaway C. H.
October, 1893.	3.34	6.07	12.61	7.74	5.37	4.74	.....	.....	3.22	2.10	6.28	6.18	4.29	4.41	.....	2.81	4.78	.....	5.74	4.70	8.17	4.03	2.86	5.73
November, "	4.30	2.71	2.34	1.50	3.15	7.13	.....	.....	8.11	7.43	2.52	2.40	5.02	3.92	.....	6.34	2.08	.....	3.50	1.90	1.41	1.79	6.75	3.42
December, "	2.54	2.50	0.72	1.81	2.37	4.80	.....	.....	3.96	3.76	1.57	0.54	1.63	1.88	.....	3.70	1.40	.....	2.19	1.02	2.12	1.82	3.05	2.92
January, 1894.	2.02	2.33	1.76	2.73	2.41	3.86	1.69	.....	3.03	3.32	2.15	1.16	1.88	1.17	.....	3.06	1.10	.....	2.52	1.55	2.11	2.85	3.54	3.22
February, "	5.15	4.35	4.42	4.03	6.16	7.50	3.40	.....	4.44	5.95	5.43	3.57	3.84	3.49	.....	4.90	4.11	.....	4.24	4.09	4.92	3.99	5.53	5.07
March, "	0.89	1.52	0.77	0.68	2.08	3.15	1.00	.....	2.31	2.77	0.86	0.50	1.02	1.38	.....	2.97	1.01	.....	1.38	0.61	0.95	2.83	2.94	1.83
April, "	2.63	2.38	2.58	1.51	3.52	4.20	1.17	.....	2.84	1.76	2.34	1.60	3.22	2.58	.....	2.62	1.63	1.08	1.78	1.76	1.64	3.54	2.11	2.40
May, "	5.60	6.93	4.32	3.27	5.23	3.40	2.87	.....	4.09	3.75	2.68	5.70	5.34	4.04	.....	4.97	3.39	3.83	3.52	3.85	4.63	3.70	3.47	5.97
June, "	1.05	0.86	2.38	1.41	3.70	1.95	2.00	0.54	2.33	2.20	1.08	1.40	1.14	0.84	.....	3.20	1.54	1.89	2.56	4.29	1.23	3.19	3.36	2.39
July, "	2.94	3.73	3.55	1.88	3.94	3.80	3.52	3.03	8.10	7.18	.....	2.24	2.68	2.51	.....	2.91	3.43	4.90	6.54	3.53	4.87	4.95	8.01	4.35
August, "	1.38	4.44	3.21	4.54	4.17	7.85	2.00	3.03	1.59	6.11	.....	1.70	.....	3.75	.....	1.61	9.99	2.72	4.54	1.29	2.57	3.43	8.45	2.73
September, "	1.13	5.72	6.70	.....	1.70	7.00	1.84	7.60	6.22	4.85	.....	5.96	.....	2.30	.....	1.56	5.31	4.83	5.44	2.41	4.16	1.19	6.49	7.30
Totals.....	32.97	43.54	45.36	.....	43.80	59.38	.....	.....	50.24	51.38	.....	33.95	.....	32.27	.....	51.64	29.24	.....	43.95	31.00	38.78	37.31	56.56	47.33
Averages.....	2.75	3.63	3.78	.....	3.65	4.95	.....	.....	4.20	4.28	.....	2.75	.....	2.69	.....	4.30	2.44	.....	3.66	2.58	3.23	3.11	4.71	3.94

TOTAL AND AVERAGE MONTHLY AND ANNUAL PRECIPITATION, &c.—Continued.

MONTHS.	Petersburg.	Richmond.	Rocky Mount.	Salem.	Saluda.	Smithville.	Spotsville.	Stantoun.	Stephen's City.	Warrenton.	Warsaw.	White's Depot.	Woodstock.	Wytheville.	Washington, D. C.	Abingdon.	Christiansburg.	Clarksville.	Danville.	Buchanan.	Richmond.	Riverton.	AVERAGES.
October, 1893.	5.56	6.14	.....	6.66	7.46	.....	6.66	5.93	7.48	4.11	6.13	.....	6.35	6.74	4.11	4.11	5.64	5.42	7.07	6.58	6.44	6.15	6.63
November, "	4.06	3.56	.....	1.66	6.42	.....	6.52	2.54	2.06	2.25	3.42	.....	2.64	1.70	4.30	1.76	1.76	2.33	1.57	1.27	3.14	2.91	3.36
December, "	3.00	2.13	.....	1.16	3.52	.....	4.90	0.59	1.05	1.62	2.72	.....	0.62	1.20	2.27	1.99	1.13	3.16	2.02	0.82	1.99	0.70	2.09
January, 1894.	3.06	3.42	.....	1.61	2.02	.....	2.99	2.79	1.21	0.94	1.98	.....	1.17	2.03	2.14	3.25	1.62	2.96	2.61	1.57	3.30	1.16	2.23
February, "	3.80	4.12	.....	3.38	4.96	.....	4.51	3.09	3.33	4.73	3.86	.....	3.10	2.64	4.64	4.91	2.25	4.77	6.53	3.61	4.68	4.15	4.37
March, "	2.02	1.39	.....	0.95	1.90	.....	2.89	0.69	0.42	0.87	1.01	.....	0.76	1.82	0.98	2.19	0.33	1.75	1.29	0.50	1.32	1.24	1.44
April, "	3.47	3.19	.....	1.42	3.46	.....	2.57	2.94	1.57	2.85	3.05	.....	1.95	1.55	3.34	2.11	0.75	2.64	1.42	1.80	3.30	2.70	2.38
May, "	5.68	6.65	.....	2.74	2.45	.....	3.86	3.38	3.33	8.11	5.93	4.47	4.92	2.31	4.03	3.39	3.73	4.48	4.38	3.17	6.32	7.14	3.99
June, "	1.96	5.40	1.12	1.99	.....	1.62	2.79	1.82	2.63	2.57	2.64	0.90	1.02	3.33	1.24	3.40	2.15	2.46	0.51	1.51	2.28	.....	2.10
July, "	4.58	2.85	3.44	3.77	.....	4.67	6.90	2.86	1.61	4.00	1.95	4.84	1.82	6.84	2.14	6.18	1.41	4.90	2.95	3.20	6.59	.....	3.96
August, "	3.56	4.93	1.32	1.96	.....	2.84	6.03	3.91	2.13	1.78	2.98	2.66	.....	2.98	2.00	5.45	1.44	3.59	3.31	2.40	4.23	.....	3.41
September, "	8.15	7.22	2.91	2.66	.....	3.18	6.86	3.48	7.16	3.61	2.97	3.55	.....	0.90	1.53	1.28	1.82	.....	.....	4.42	7.27	.....	4.32
Totals.....	48.90	61.00	.....	29.96	.....	.....	57.28	34.02	33.98	37.74	38.03	.....	.....	34.04	32.72	40.02	24.03	.....	.....	30.85	47.74	.....	.....
Averages.....	4.08	4.25	.....	2.50	.....	.....	4.77	2.84	2.83	3.14	3.17	.....	.....	2.84	2.73	3.34	2.00	.....	.....	2.57	3.98	.....	3.41

The appended letters are printed by the order of the Board to show the extent of the work of the Virginia State Weather service and the benefits derived from the work by the agricultural classes of the State:

LYNCHBURG, VA., *October 8, 1894.*

Hon. THOMAS WHITEHEAD,
*Commissioner of Agriculture,
Richmond, Va.:*

MY DEAR MR. WHITEHEAD:

In view of the fact that the Board of Agriculture has cut off the \$20 appropriation for the monthly reports, I take the liberty of addressing you a line respectfully asking if this action of the Board is final, with the assurance on my part that whether it is or not, I have no comments to make pro or con, and I would not influence any member either way if I could.

I am persuaded that there are many of our people—it may be possible that some of them are members of the Board—who do not fully appreciate the benefit of the weather service at all, those in the country primarily, and in the cities secondarily. If we have no reports we will need no reporters or stations from where the reports come, and consequently no one to receive frost warnings, &c., or to promulgate them as we have now.

Owing to the almost perfect system to which the government service has already been brought, and it is improving every day, frost can be foretold with almost absolute certainty from forty-eight to sixty hours, and it seems to me much a warning is hard to estimate in value to those who have not already gathered their tobacco, to say nothing of other products of our plantations, truck patches, gardens, &c.

When the directors, who had the matter in hand, undertook to determine the dates, or rather the week in which the agricultural fair should be held, got our local observer here to take his twenty-three years records and make a calculation as to the most probable week of clear weather during October, and by a mathematical calculation he arrived at the conclusion by averaging the weather conditions for the twenty-three Octobers, that the first week would most likely be clear, and by a singular coincidence, it rained more or less every day of the week during the last week in September, whilst we had fair weather during all of the first week of October, whilst our fair was going on, and very curiously, to-day, the commencement of the second week, it is raining and promises to do so for days to come. You may say this was all a guess, and if it was, we have a first rate guesser in Mr. Ryker, our observer at our central station.

Anyone with moderate intelligence who will study the weather charts carefully and regularly, and all can if they will, can, in our section of the United States, foretell with wonderful accuracy what kind of weather, rain, fair or the temperature, several days in advance of its arrival. As our *weather* usually comes from the northwest, this is an advantage the east has over the west. When the currents are from the east, as there *are not yet* observation stations in mid ocean, there is no means of calculating any probabilities.

The Government Weather Service you know also telegraphs in advance, *with absolute certainty*, flood warnings. If the weather stations and reporters are to be abolished, as they will be when the appropriation stops, who is to post and promulgate these warnings when they are sent out, if they are, by the central office?

Am I presuming if I respectfully remind you, and request you to remind the

Board, that every one of our State reporters *give* their services to the State, and that not one cent of the \$20 heretofore appropriated has ever been expended in any way, except to pay the actual cost of printing the report, and that it is not in contemplation to spend any of the board's money in any other way.

It seems to me these matters are worthy of careful consideration before abolishing our Virginia Weather Service.

Yours very truly,

E. A. CRAIGHILL,
Director State Weather Service.

LYNCHBURG, VA., October 10, 1894.

Col. THOS. WHITEHEAD,

Commissioner of Agriculture and Secretary of Board,

Richmond, Va. :

DEAR SIR :

In reply to your letter of the 9th instant, requesting a statement as to number of monthly reports issued, and to whom, and the same as to weekly weather-crop bulletins, etc., I have the honor to state that 300 monthly reports are printed and mailed to the members of the State Board of Agriculture, the State officers, the State institutions, high schools and other educational institutions in the State, the press of Virginia, the volunteer observers of Virginia, to the directors of the other State weather services, boards of trade, etc., etc.

About 300 crop bulletins are issued weekly during the crop-growing season, and mailed to similar places and persons.

I enclose you copies of the mailing lists for the monthly reports, and the weekly bulletins, and will state that if the board desires to revise the list we will be pleased to have it done, remembering that the other State weather services and file copies for this and the Washington offices should be allowed for, and also a few copies for additional observers; the issue ought really to be as much as 500, as reported by me to the board at your meeting here last Spring. The weekly bulletins have been issued by hand printing, and therefore the issue is necessarily limited in size and numbers. If the board would provide for printing the same, we will issue as many as you desire, up to five thousand or more (Ohio issues about 13,000 weekly, I believe), if you will supply us printed mailing lists for preparing addressed wrappers.

We also issue A. M. weather maps daily to about eighty stations outside of this city which can be reached in time for practical use; also about twenty-eight bulletins with the P. M. weather forecasts (in addition to telegraphic forecasts from Washington, to as many more), and we are informed by station agents and postmasters that the farming communities are more and more learning to rely on these reports for guidance in plans for saving crops, etc.

We have recently been arranging to give notice of early and late frosts, and warnings of cold waves, and unusually severe storms, to a largely increased number of points having telegraphic facilities.

A study of the location of stations from whence reports as to daily temperature readings and rainfall records, will show you that we secure records from the differ-

ent sections of the State that may be made very valuable by your board and by your Commissioner of Immigration (this is done in other States, notably by Louisiana and Texas), and when a longer series of records shall have been obtained you will have reliable data by which to show the advantages of your State, as to climate, etc., to the outside people.

You now receive co-operation from the National Weather Bureau that it would cost you three to four thousand dollars per annum to provide, if such co-operation were withdrawn, and you secure this by an expenditure of less than three hundred per annum. Many of the other States appropriate sums ranging from one to five, or more, thousand dollars per annum, but your legislature saw fit to refuse similar co-operation.

The Chief of the Weather Bureau was contemplating (last January) the location of the central office at Richmond, instead of here at Lynchburg, but the matter was dropped when it was found that your legislature did not appreciate the work enough to give it any aid, or even to provide for formal establishment of a "Virginia State Weather Service."

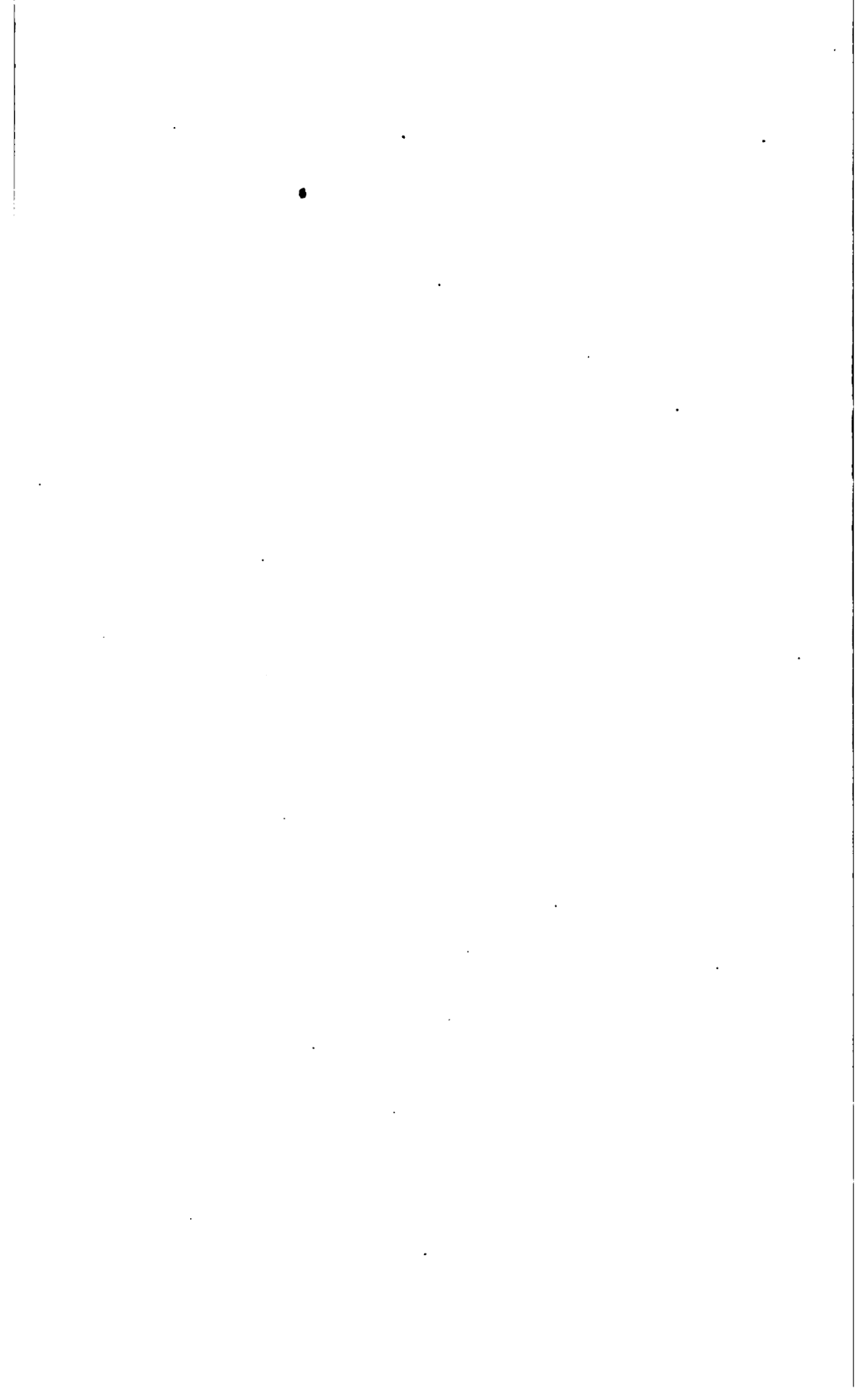
Some of the members of your board are cognizant of the difficulties and discouragements under which the undersigned has had to work in bringing the work in this State up to its present standing, and it is not thought that the board will cut off the appropriation necessary for the publication of the data that is being secured for you without other expense. We also furnish you data for the annual report of the Commissioner of Agriculture, and the climatic data that was published in your "Hand-Book of Virginia" will prove worth all the money you will appropriate, at present rate, in twenty-five years.

I enclose you copies of the publications referred to above.

Very respectfully,

J. N. RYKER,

Observer Weather Bureau and Assistant Director Virginia S. W. S.



REPORT OF THE CHEMIST.

REPORT OF THE CHEMIST.

RICHMOND, VA., *October 20, 1894.*

Hon. THOMAS WHITEHEAD, Commissioner :

SIR :

I have the honor to submit herewith the report of the work done in the laboratory of the department for the year 1894 :

The following is a summary of the samples analyzed :

Fertilizer samples taken by the inspectors.....	521
Fertilizer samples presented by farmers.....	52
Soils.....	27
Marls.....	14
Miscellaneous	10
Total.....	624

A supplementary bulletin will be issued containing analyses of samples sent in by the inspectors too late to be finished in time for publication in this report.

In comparison with the reports of previous years it will be seen by the above table that a greater number of farmers than heretofore have taken advantage of the privileges extended by the Acts of 1890, by which, under certain regulations, they are allowed to submit samples of fertilizers and soils for analysis free of charge.

CLASSIFICATION OF THE INSPECTORS' SAMPLES.

Nitrogenous superphosphates with potash.....	365
Nitrogenous superphosphates.....	31
Superphosphates with potash.....	32
Plain superphosphates.....	55
Bone meal.....	29
Potash salts.....	3
Miscellaneous materials.....	6
Total.....	521

Separate tables of the above analyses will be found appended to the report. By examination of these tables it will be observed that many of the brands of fertilizers offering for sale in the State were analyzed more than once, and some as many as five or six times. So much repetition would seem unnecessary except in cases where a manufacturer is suspected of endeavoring to put a fraudulent article on the market.

SCALE OF VALUATIONS FOR THE YEAR.

Available phosphoric acid.....	5 cents per pound.
Ammonia.....	15 “ “
Potash.....	5 “ “

The conditions prevailing in the fertilizer trade during the present year were practically the same as in 1893; thus the valuations adopted for that year remain unchanged. To repeat, therefore, the valuations reckoned for manipulated fertilizers by use of the above figures will be found to agree fairly with the retail price at large markets, plus the cost of mixing and sacking, of standard raw materials, such as—

Sulphate of ammonia,	Nitrate of soda,
Dried blood,	Dried ground meat,
Azotin,	Dried ground fish,
Ammonite,	Bone and tankage,
Plain superphosphates,	Muriate of potash,
Kainit,	Sulphate of potash.

The approximate market value of the different brands of fertilizers obtained by the current mode of valuation does not express their respective agricultural value. The crop-producing value of a fertilizer must be determined by a rather complex investigation, involving the chemical and physical character of the soil, the special wants of the crops to be raised, and the particular forms of the guaranteed essential articles of plant food in the fertilizer.

In order to select wisely of the fertilizers offered, the farmer should first satisfy himself that a particular brand contains the guaranteed quantities and qualities of essential elements at reasonable cost, and next that it contains them in such forms and in such proportions as will best meet existing circumstances and special wants. In some cases it may be nitrogen alone needed; in others, potash, and in others, phosphoric acid. In still others, two, or all three, of the essential ingredients may be required.

Farmers should not forget that the mechanical condition of fertilizers is a matter of great importance, affecting their value. The degree of pulverization controls almost without exception, under similar conditions, the rate of solubility and the more or less rapid diffusion of the different articles of plant food throughout the soil.

In this connection it would not be amiss to state a summary of rules touching the use of fertilizers, as given by one of the leading experiment stations of the country:

1. All crops demand soluble plant food in proper amounts.
2. The plant food most deficient in our soils is potash, phosphoric acid, and nitrogen.
3. All plants readily respond to applications of potash and phosphoric acid, and all but the leguminous plants to that of nitrogen.
4. The leguminous plants—*i. e.*, peas, alfalfa, clover, etc.—are able to gather and appropriate nitrogen in abundance from the atmospheric air.
5. Large crops mean the buying of potash and soluble phosphoric acid fertilizers, and, unless a proper rotation is adopted, that of nitrates and other nitrogenous manures.

6. Potash salts may be applied either in fall or in spring; soluble phosphoric acid and nitrates in spring only.

7. For deep-rooting plants potash and phosphoric acid should be deeply plowed under and the soil should receive a top dressing in addition.

8. Beneficial results follow the application of lime and that of indirect fertilizers, such as salt.

9. A proper rotation, different under different conditions, may be looked upon as a vital measure for making farming a profitable and satisfactory occupation.

SOIL ANALYSES.

Twenty-seven samples of soil were received from farmers of the State during the year and analyzed. The following may be taken as typical :

Four samples from Mr. G. E. Jackson, Princess Anne county :

	I.		II.	
	Top Soil.	Sub Soil.	Top Soil.	Sub Soil.
Water.....	15.80	12.00	18.10	15.00
Phosphoric acid (in dry soil).....	.08	.11	.09	.11
Potash, .....	.05	.09	.09	.05
Lime, " .....	.10	.09	.16	.17
Nitrogen, " .....	.09	.....	.10	

Four samples of soil from Mr. Andrew Stone, Union Mills, Va :

	I.		II.	
	Top Soil.	Sub Soil.	Top Soil.	Sub Soil.
Water.....	7.48	10.66	19.62	19.62
Phosphoric acid (in dry matter).....	.13	.16	.20	.17
Lime, " .....	.17	.14	.....	Trace.
Potash, " .....	.10	.09	.10	.08
Ammonia, " .....	.17	.09	.29	.13
Nitrogen, " .....	.14	.07	.24	.10

Sample of soil received from Dr. J. L. Kent, Bertha, Va. :

Phosphoric acid.....	.21
Lime.....	.30
Potash.....	.07
Ammonia.....	.15
Nitrogen.....	.12

It is to be regretted that agricultural chemistry has not arrived at that state of advancement when it can be ascertained what is wrong with a soil from its analysis. A soil may possess an abundance of plant food, as indicated by the analysis, and yet have it in such a state of insolubility as to be practically sterile for agricultural purposes. Analyses of soils, therefore, are so often misleading that they cannot be relied upon as guides to what elements are needed to render the soil productive. By soil analysis we can tell what important elements are entirely absent, and to this extent it is sometimes useful.

MARLS.

A considerable number of samples of marls were analyzed for farmers in eastern Virginia during the year. Many of the specimens received were too poor in quality to be of interest either in agriculture or otherwise. Nearly all the samples received belonged to the class of so-called shell marls, with carbonate of lime as the only constituent of value, found in the recent geological formations of lower Virginia.

The following examples may be taken as typical:

Sample received from Mr. J. W. Almond, Newport News, Va. :

Carbonate of lime.....	58.78
Phosphoric acid.....	trace.

Sample received from Mr. Thomas Guy, Malvern Hill, Va. :

Carbonate of lime.....	41.28
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The local use of marl in Virginia has continued to decrease during the last several years, being displaced by commercial fertilizers. It has been used to a slight extent as a basis for other fertilizers, but so far without very satisfactory results. The value of marl as a fertilizer has been fully discussed in previous reports.

MISCELLANEOUS MATERIALS.

Analysis of sample of double salt of potash and magnesia received from Captain Orris A. Browne, Cape Charles, Va. :

Potash.....	36.70
Equivalent in potassium sulphate.....	67.86
Magnesia.....	10.60
Equivalent in magnesium sulphate.....	31.78
Sodium chloride.....	trace.
	<hr/> 99.64

Analysis of sample of tan bark ashes received from Mr. G. W. Smith, Chesterfield county :

Phosphoric acid.....	1.38
Potash.....	1.82

THE FERTILIZER LAW.

This law is published here for the benefit of farmers and manufacturers, who should be fully informed of its provisions :

THE VIRGINIA FERTILIZER LAW.

An act to protect and advance Agriculture by regulating the sale and purity of Commercial Fertilizers and the guarantee and condition upon which they are to be sold, and fixing the penalties incurred for violations of the same ; amended by act approved March 8, 1894.

1. Be it enacted by the General Assembly of Virginia, That the commissioner of agriculture shall have special charge of the inspection and analysis of fertilizers

or chemicals, or ingredients for manufacturing the same, sold or offered for sale in this state.

2. It shall be the duty of any manufacturer or dealer in commercial fertilizers, annually, before the same are offered for sale in this state, to pay to the commissioner of agriculture a registration fee of one hundred dollars, which fee shall entitle the said manufacturer or dealer to register with the commissioner of agriculture not exceeding ten names or brands under which he proposes to sell his fertilizers in this state, and for each and every additional name or brand over and above the ten above provided for, the manufacturer or dealer shall pay an additional registration fee of ten dollars, but any one manufacturing not more than one hundred tons in one year, upon certifying the same to the commissioner of agriculture, shall pay a tax of ten dollars only. It shall also be the duty of the said manufacturer or dealer to submit to the commissioner of agriculture a written or printed statement, setting forth—first, the names and brands under which his said fertilizers are to be sold, the number of pounds contained, or to be contained, in the package in which they are to be put upon the market for sale, and the name or names of the manufacturers, and the place of manufacture; second, a statement setting forth the per centum of the named ingredients which they are willing to guarantee said fertilizers to contain—first, ammonia; second, available phosphoric acid; third, insoluble phosphoric acid; fourth, potash soluble in water. Such statements so to be furnished shall be considered as constituting a guarantee to the purchaser that every package of such fertilizer contains not less than the per centum of each ingredient set forth in the statement. This shall, however, not preclude the party making the statement from setting forth any other ingredient which his fertilizer may contain, which additional ingredient shall be considered as embraced in the guarantee above stated.

3. Every person proposing to deal in commercial fertilizers shall, after filing the statement above provided for with the commissioner of agriculture, receive from the said commissioner of agriculture a certificate stating that he has complied with the foregoing section, which certificate shall be furnished by the commissioner without any charge therefor. The said certificate, when furnished, shall authorize the party receiving the same to manufacture for sale in this state, or to sell in this state, directly or through dealers or agents, the brands named in said certificate. No person who has failed to pay the fee aforesaid, to file the statement aforesaid, and to receive the certificate of authority aforesaid, shall be authorized to manufacture or offer for sale in this state commercial fertilizers; and any person so manufacturing for sale in this state, or so dealing or selling, without having paid the aforesaid fee, filed the aforesaid statement, and received the certificate aforesaid (except dealers and agents selling or offering for sale fertilizers on which the fee has been paid by and certificate issued to the manufacturers, as provided in sections two and three of this act), shall be liable, for each violation, to a fine not exceeding one thousand dollars, which fine shall be recoverable before any court of competent jurisdiction, at the suit of the commissioner of agriculture, or of any citizen, and shall be disposed of as hereafter provided.

4. All fertilizers or chemicals, or ingredients for manufacturing or composting the same, offered for sale or distribution in this state, shall have printed upon or attached to each bag, barrel or package, in such manner as the commissioner of agriculture may by regulation establish, the guaranteed analysis of such fertilizer or chemical or ingredients as claimed by the manufacturer, showing the per centum

of valuable ingredients such fertilizer or chemical contains, which shall be the same as that contained in the statement required to be submitted to the commissioner of agriculture, except when the fertilizer or chemical or ingredient is shipped in bulk. Any person violating the provisions of this section shall be fined not less than fifty dollars in each case.

5. The commissioner of agriculture shall obtain fair samples of all brands of fertilizers sold or offered for sale in this state by manufacturers or dealers, and shall have them analyzed by the official chemist, and shall publish the analysis for the information of the public.

6. Every person who sells a lot or package of commercial fertilizer or chemical, or ingredient for manufacturing the same, upon the request of the purchaser shall draw from the same at the time of its delivery to the purchaser, and in the presence of the purchaser or agent, a fair and correct sample, and in the presence of both seller and buyer the sample thus drawn shall then be put in a glass or tin vessel and securely sealed, and there shall then be placed on said vessel a label, and on said label shall be inscribed a certificate signed by both parties, setting forth that the enclosed sample is a fair and correct sample, the name of the manufacturer, name of the fertilizer from which sample was drawn, and time and place when it was drawn, and the vessel shall then be packed and forwarded to the commissioner of agriculture, and the commissioner of agriculture, on the analysis of said sample, shall forward one copy to the seller and one copy to the purchaser of said fertilizer. If the analysis of any fertilizer obtained through an inspection, or in the manner above prescribed, shall fall ten per centum in value below the value of the manufacturer's guaranteed analysis, the commissioner of agriculture may forbid its further sale in this state, and the purchaser shall be entitled to recover of the manufacturer the purchase money thereof: provided the purchase price has been paid by him, and the seller shall be debarred from any recovery of the purchase price of said fertilizer if the same is then unpaid, but an appeal shall lie from the decision of the commissioner of agriculture to the board of agriculture, who shall give due notice to the manufacturer, and a hearing with full opportunity to produce evidence before them. The decision of the board of agriculture shall be final.

7. The copy of the official chemist's analysis of any fertilizer or chemical certified to by him shall be admissible as evidence in any court of this state on the trial of anything involving the merits of said fertilizer.

8. The board of agriculture shall adopt all needful rules and regulations providing for the collection of the money arising from the fees aforesaid or from fines imposed under this act, and shall require the same to be deposited with the treasurer of the state, and only to be drawn therefrom upon the warrants issued by the auditor of the state, out of which shall be paid only the expense of carrying out the provisions of this act, which shall not exceed fifteen hundred dollars in any one year.

9. The commissioner of agriculture shall keep a correct and faithful account of all fees received and certificates issued by him, showing from whom the fees were received, and, as far as practicable, for what fertilizers the certificates were intended to be used, and the amount of money arising from fines under this act.

10. The term "commercial fertilizer" or fertilizers, where the same are used in this act, shall not be held to include lime, land plaster, ashes or common salt, or any chemical or ingredients used in manufacturing fertilizers intended for sale.

All fertilizers sold or offered for sale in violation of this act shall be seized by the commissioner of agriculture or his agent, and shall be delivered to the officer of the court having jurisdiction of the offence, and said fertilizers shall be subject to the disposition made of the same by said court. All moneys arising from seizures of fertilizers shall be for the use and benefit of the board of agriculture.

11. No fees shall be charged for analysis of fertilizers made under this act.

12. All acts or parts of acts inconsistent with this act are hereby repealed.

13. This act shall be in force from its passage.

SAMPLING.

For the benefit of farmers and manufacturers who desire to take advantage of the provisions of the sixth section of the above law, by which analysis may be obtained free of charge, the following rules for sampling are given: For consignments of several tons or more, select at least five sacks, taking from here and there and empty them in a pile upon a clean dry floor. Mix thoroughly with a shovel, crushing any lumps. Next take about ten equal cups full from different parts of the pile and pour them one over another upon a paper; intermix again thoroughly but quickly, to avoid moisture; fill a glass jar with capacity of not less than ten ounces, seal air tight and label carefully, taking the exact copy of what is printed on the bags.

Much unpleasant friction with manufacturers will be spared the Department if these rules of taking samples are observed. Unless fair samples are presented the result of the analysis are misleading or worthless.

I have the honor to be,

Very respectfully,

RICHARD H. GAINES.

ANALYSES.

ANALYSES OF FERTILIZERS BY THE VIRGINIA DEPARTMENT OF AGRICULTURE FOR 1894.

TABLE No. 1.—NITROGENOUS SUPERPHOSPHATES WITH POTASH.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,000	Alliance Favorite.	Cockrell & Reed, Reedville, Va.	Norfolk, Va.
1,018	Allen's Best High-Grade Guano.	Tygett-Allen Fertilizer Company, Philadelphia, Pa.	"
1,019	Allen's Ten Per Cent Guano.	"	"
1,020	Allen's Fish Bone and Potash.	"	Berkeley, Va.
1,047	Accomac, for Spring and Summer Crops.	Taylor & Treadwell, Norfolk, Va.	Sassafras, Va.
1,123	Alliance Favorite.	Cockrell & Reed, Reedville, Va.	Chase's Wharf, Va.
1,132	Ammoniated Bone Superphosphate.	Excelsior Guano Company, Baltimore, Md.	Nandua, Va.
1,173	Accomac Sweet Potato Fertilizer.	Zell Guano Company, Baltimore, Md.	Parkley, Va.
1,195	Americus Brand Fine Wrapper Tobacco Guano.	Williams & Clark Fertilizer Company, New York	Parkley, Va.
1,198	Americus Brand High Grade Special.	Williams & Clark Fertilizer Company, New York	Hallwood, Va.
1,211	Ammoniated Bone Superphosphate.	Tygett-Allen Fertilizer Co. (for S. H. Howitz), Philadelphia, Pa.	Hallwood, Va.
1,212	Azozolized Dissolved Bone.	Tygett-Allen Fertilizer Co. (for S. H. Howitz), Philadelphia, Pa.	Alexandria, Va.
1,256	Ammoniated Bone Phosphate.	Susquehanna Fertilizer Company, Baltimore, Md.	Blackstone, Va.
1,274	Allison & Addison's Star Brand Special Tobacco Manure.	Allison & Addison, Richmond, Va.	Blackstone, Va.
1,275	Allison & Addison's Star Brand Guano.	"	Pamplin, Va.
1,299	Anchor Brand Fertilizer.	"	Lynchburg, Va.
1,315	Alliance Bone Mixture.	Richmond Guano Company, Richmond, Va.	Lynchburg, Va.
1,316	Appomattox Standard Tobacco Guano.	James G. Tinsley & Co., Richmond, Va.	Salem, Va.
1,367	All-Crop Fertilizer.	Wright & Craighill, Lynchburg, Va.	Salem, Va.
1,368	Ammoniated Bone.	Maryland Fertilizer and Manufacturing Co., Baltimore, Md.	Warrenton, Va.
1,385	Ammoniated Dissolved Bone.	Alexandria Fertilizer and Manufacturing Co., Alexandria, Va.	Winchester, Va.
1,471	Ammoniated (G. P.) Superphosphate of Lime.	Mount Airy Manufacturing Company, Baltimore, Md.	Salem, Va.
1,502	Ammoniated Bone.	Maryland Fertilizer and Manufacturing Company, Baltimore, Md.	Christiansburg, Va.
1,513	Allison & Addison's Star Brand Guano.	Allison & Addison, Richmond, Va.	"
1,443	A. L. Sherer's Best Ammoniated Dissolved Bone for Wheat.	G. Ober & Sons Company, Baltimore, Md.	"
1,447	" " Ammoniated Dissolved Bone.	"	"
1,448	" " Bone Mixture for Wheat.	"	Norfolk, Va.
1,014	Berry Guano.	Baltimore Guano Company, Baltimore, Md.	"
1,032	Brown & Gilman's Ten Per Cent Guano.	Brown & Gilman, Philadelphia, Pa.	"
1,033	Brown & Gilman's No. 3 for General Use.	Brown & Gilman, Philadelphia, Pa.	"

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.			GUARANTEE IN DEPARTMENT.			ANALYSIS BY CHEMIST.							Relative commercial value per ton of ingredients at seaboard.			
		Avail. Phos. Acid.	Ammonia.	Potash.	Insol. Phos. Acid.	Avail. Phos. Acid.	Ammonia.	Potash.	Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Revised Phos. Acid.	Avail. Phos. Acid.	Nitrogen.			Equiv. to Ammonia.	Potash.
1,000	Alliance Favorite.....	8.00	3.50	3.00	.....	8.00	3.50	3.00	9.60	1.92	2.40	2.59	4.99	2.76	3.36	4.28	\$21 50	\$20 01
1,018	Allen's Best-Grade Guano.....	5.00	10.00	2.50	.....	5.00	10.00	2.50	8.20	2.56	3.50	2.00	5.50	8.56	10.40	3.16	37 50	39 86
1,019	Allen's Ten Per Cent Guano.....	5.00	9.00	5.00	.....	5.00	9.00	5.00	8.70	1.54	3.45	2.17	5.62	7.92	9.61	5.06	37 00	39 51
1,020	Allen's Fish Bone and Potash.....	5.00	4.00	3.00	.....	5.00	4.00	3.00	10.20	2.56	4.30	1.97	6.27	3.60	4.38	3.52	20 00	22 93
1,047	Accomac, for Spring and Summer Crops.....	9.00	3.00	3.00	.....	9.00	3.00	3.00	10.80	1.41	7.75	1.65	9.40	2.69	3.28	2.74	21 00	21 98
1,123	Alliance Favorite.....	8.00	3.50	3.50	.....	8.00	3.50	3.50	11.80	1.78	2.50	2.87	5.37	1.87	2.17	2.32	12 50	14 20
1,132	Ammoniated Bone Superphosphate.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	11.80	1.66	7.70	2.35	10.05	1.72	2.09	3.20	15 00	19 52
1,173	Accomac Sweet Potato Fertilizer.....	8.00	1.50	2.00	.....	8.00	1.50	2.00	10.40	3.77	3.10	4.71	7.81	1.36	1.65	1.86	14 50	14 82
1,195	Americus Brand Fine Wrapper Tob. Fertilizer.....	7.00	7.00	10.00	.....	7.00	7.00	10.00	4.00	2.87	3.15	3.55	5.70	5.33	7.19	9.86	37 00	37 13
1,198	Americus Brand High Grade Special.....	7.00	4.50	7.00	.....	7.00	4.50	7.00	9.20	3.51	3.05	4.83	7.88	3.99	4.85	6.48	27 50	28 91
1,211	Ammoniated Bone Superphosphate.....	9.00	2.50	2.00	.....	9.00	2.50	2.00	11.00	1.54	6.10	1.96	8.06	1.72	2.08	3.20	18 50	16 52
1,212	Azotized Dissolved Bone.....	9.00	1.50	2.00	.....	9.00	1.50	2.00	11.00	1.28	4.12	3.04	7.16	1.30	1.58	2.62	11 00	15 52
1,256	Ammoniated Bone Phosphate.....	9.00	1.50	1.50	.....	9.00	1.50	1.50	8.80	2.68	9.05	.81	9.86	1.93	2.35	3.08	15 00	19 99
1,274	A. & A.'s Star Brand Special Tobacco Manure.....	8.00	2.75	1.50	.....	8.00	2.75	1.50	12.00	1.28	8.95	1.86	10.81	2.25	2.73	1.66	18 75	20 66
1,299	Anchor Brand Fertilizer.....	8.00	2.00	1.25	.....	8.00	2.00	1.25	12.60	2.75	7.30	1.85	9.15	2.35	2.35	1.24	15 25	18 44
1,315	Alliance Bone Mixture.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	15.20	2.43	7.80	1.35	9.15	2.19	2.66	1.82	15 50	18 95
1,316	Apponattox Standard Tobacco Guano.....	8.00	1.00	1.00	.....	8.00	1.00	1.00	14.80	1.08	8.01	3.61	11.71	1.00	1.21	2.32	12 00	17 66
1,367	All-Crop Fertilizer.....	1.00	2.00	2.00	.....	1.00	2.00	2.00	10.60	.83	7.75	1.62	9.27	1.58	1.92	3.62	16 00	18 65
1,368	Ammoniated Bone.....	9.00	2.25	1.50	.....	9.00	2.25	1.50	7.00	.....	.....	.....	90	1.61	1.96	5.52	13 00	12 80
1,385	Ammoniated Dissolved Bone.....	8.00	1.75	1.50	.....	8.00	1.75	1.50	7.00	4.41	6.95	2.33	9.28	2.07	2.51	2.20	17 25	19 01
1,471	Ammoniated (G. P.) Superphosphate of Lime.....	8.00	1.30	1.00	.....	8.00	1.30	1.00	5.80	1.08	5.40	2.80	9.20	1.57	1.91	1.86	14 75	16 87
1,502	Ammoniated Bone.....	9.00	2.25	1.50	.....	9.00	2.25	1.50	10.60	1.03	3.71	1.33	9.08	2.12	2.57	2.24	17 25	19 03
1,513	A. & A.'s Star Brand Guano.....	8.00	2.00	1.25	.....	8.00	2.00	1.25	12.40	2.20	8.20	1.82	10.02	2.50	3.04	1.50	15 25	20 64
1,443	A. L. Sherer's Best Am. Diss. Bone for Wheat.....	10.00	1.50	1.50	.....	10.00	1.50	1.50	11.60	2.23	10.15	2.72	12.87	1.88	2.29	1.46	16 00	21 20
1,447	" " Ammoniated Diss. Bone.....	8.00	1.00	1.50	.....	8.00	1.00	1.50	10.80	2.43	9.60	1.27	10.87	1.45	1.77	1.16	12 50	17 64
1,448	" " Bone Mixture for Wheat.....	8.00	1.00	1.50	.....	8.00	1.00	1.50	7.00	2.49	8.40	1.52	9.92	1.21	1.48	1.16	11 50	15 52
1,014	Berry Guano.....	8.00	1.00	3.00	.....	8.00	1.00	3.00	10.20	2.56	5.55	2.12	7.67	3.35	4.06	3.70	24 00	23 55
1,032	Brown & Gilman's Ten Per Cent Guano.....	4.00	10.00	2.00	.....	4.00	10.00	2.00	13.40	1.79	6.00	3.59	4.09	7.98	9.69	2.58	36 00	35 74
1,033	Brown & Gilman's No. 3 General Use.....	6.00	3.00	4.00	.....	6.00	3.00	4.00	12.60	2.43	1.10	4.91	6.01	3.16	3.84	4.48	19 00	22 31

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.			GUARANTEE IN DEPARTMENT.				ANALYSIS BY CHEMIST.							Relative commercial value per ton of ingredients at seaboard.		
		Avail. Phos. Acid.	Ammonia.	Potash.	Insol. Phos. Acid.	Avail. Phos. Acid.	Ammonia.	Potash.	Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Revised Phos. Acid.	Avail. Phos. Acid.	Nitrogen.	Equiv. to Ammonia.	Potash.	By Guarantee.	By Analysis.
1,036	Baugh's Seven Per Cent Potato Guano.....	6.00	7.00	5.00	.....	6.00	7.00	5.00	11.20	1.92	5.60	1.56	7.16	5.66	6.87	5.00	\$32 00	\$32 83
1,038	" " Animal Bone and Potash.....	8.00	2.00	2.00	.....	8.00	2.00	2.00	12.20	3.33	5.60	2.88	8.18	1.90	2.31	2.12	16 00	17 24
1,039	" " Seven Per Cent Potato Guano.....	6.00	7.00	5.00	.....	6.00	7.00	5.00	9.40	1.85	5.06	1.67	6.72	5.62	6.81	4.78	32 00	31 95
1,060	" " New Process Ten Per Cent Guano.....	8.00	10.00	4.00	.....	8.00	10.00	4.00	8.60	3.77	2.40	2.21	4.61	9.31	11.30	3.56	42 00	42 07
1,080	Bidgood Manure Substitute.....	7.00	4.00	4.00	.....	7.00	4.00	4.00	10.80	2.56	5.60	2.71	8.31	3.06	3.71	3.28	23 00	22 72
1,085	Baugh's Seven Per Cent Potato Guano.....	6.00	7.00	5.00	.....	6.00	7.00	5.00	7.00	2.43	5.60	1.28	6.78	5.21	6.33	4.68	31 00	30 45
1,100	Brown & Gilman's Ten Per Cent Guano.....	4.00	10.00	2.00	.....	.....	.....	.....	13.80	.90	.25	.49	4.91	7.51	9.12	3.60	36 00	35 87
1,107	Bidgood's High Grade Truck Guano.....	7.00	8.00	4.00	.....	7.00	8.00	4.00	9.60	1.98	5.10	2.39	7.49	6.12	7.42	4.18	35 00	33 93
1,112	Baugh's New Process Ten Per Cent Guano.....	.....	10.00	4.00	.....	.....	10.00	4.00	7.60	4.35	1.73	2.69	4.42	9.30	11.29	3.86	34 00	42 15
1,117	Beef, Blood and Bone.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	12.00	.90	6.97	1.72	8.69	1.65	2.01	1.86	15 00	16 58
1,147	Baker's Special Wheat and Grass Fertilizer.....	9.00	1.00	2.00	.....	9.00	1.00	2.00	11.20	1.98	6.25	4.12	10.37	1.02	1.24	3.20	16 00	17 29
1,189	Baugh's Seven Per Cent Potato Guano.....	6.00	7.00	5.00	.....	6.00	7.00	5.00	8.60	3.17	6.15	1.67	7.82	4.71	5.71	5.52	32 00	30 47
1,191	" " Sweet Potato Guano.....	8.00	3.00	3.00	.....	8.00	3.00	3.00	9.00	4.35	4.12	3.49	7.61	2.88	3.50	3.52	20 00	21 63
1,203	" " High Grade Potato Guano.....	8.00	5.00	5.00	.....	8.00	5.00	5.00	10.00	3.77	5.20	2.74	7.94	4.26	6.18	4.82	28 00	28 80
1,205	Bay Island Guano.....	8.00	2.50	2.50	.....	8.00	2.50	2.50	9.00	2.56	8.24	2.19	10.43	1.79	2.18	3.44	17 87	20 41
1,234	Bryant Corn and Oats Fertilizer.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	10.20	1.92	5.90	1.95	8.44	1.71	2.07	1.45	15 00	16 10
1,258	Beef, Blood and Bone.....	22.00	2.00	2.00	.....	7.00	2.00	2.00	8.80	2.75	7.95	1.96	9.91	1.65	2.00	2.66	15 00	18 77
1,264	Beef, Blood and Bone.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	10.80	1.85	5.65	3.12	8.77	1.73	2.10	1.32	15 00	16 35
1,265	Belleville Guano.....	8.00	4.00	2.00	.....	8.00	4.00	2.00	4.20	2.17	5.60	1.51	7.11	3.28	3.99	1.28	22 00	20 40
1,308	Baugh's Am. Bone and Potash Compound.....	8.00	2.00	2.00	.....	8.00	2.00	2.00	12.60	4.15	6.50	1.76	8.26	2.04	2.48	2.40	16 00	18 10
1,327	Baldwin's Ammoniated Dissolved Bone.....	8.75	2.75	1.75	.....	8.75	2.75	1.75	7.40	1.15	6.60	2.32	8.83	2.52	3.06	2.08	18 75	20 09
1,377	Bono Tobacco Fertilizer.....	9.00	2.50	1.50	.....	9.00	2.50	1.50	9.20	4.67	6.50	1.88	8.38	2.06	2.51	1.86	18 00	18 25
1,397	Bryant's Formula "E".....	7.00	2.00	3.00	.....	7.00	2.00	3.00	7.80	2.77	7.10	3.34	8.44	1.90	2.29	2.94	16 00	17 77
1,438	" " Fine Dissolved Bone.....	8.00	3.00	1.00	.....	8.00	3.00	1.00	9.00	2.81	8.05	1.16	9.21	2.73	3.32	1.62	18 00	20 79
1,439	" " Formula "F".....	7.00	2.00	2.00	.....	7.00	2.00	2.00	10.20	2.30	6.85	4.03	10.88	1.88	2.29	1.94	15 00	19 09
1,441	" " Ammoniated Dissolved Bone.....	8.00	3.00	1.25	.....	8.00	3.00	1.25	10.20	2.49	7.95	1.52	9.47	2.62	3.18	1.36	15 00	20 87
1,447	Beverley's Mixture.....	6.25	2.00	1.00	.....	6.25	2.00	1.00	11.60	1.60	7.70	.80	8.50	1.71	2.08	1.08	13 50	18 80
1,475	Baugh's Crop Grower.....	8.00	1.00	1.00	.....	8.00	1.00	1.00	9.40	2.23	7.30	.83	9.73	1.08	1.32	1.86	15 00	16 77
1,498	Beef, Blood and Bone.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	9.40	2.23	7.30	.83	9.73	1.08	1.32	1.86	15 00	16 77
1,012	Coast Line Ten Per Cent Quick Truck.....	6.00	10.00	3.00	.....	6.00	10.00	3.00	11.00	.90	5.85	.41	6.26	7.02	8.53	2.82	35 00	34 67
1,031	" " Crab Scrap.....	2.00	6.00	5.00	.....	2.00	6.00	5.00	12.00	.38	.....	3.20	3.20	4.16	5.06	5.68	28 00	24 06

* Bone Phosphate.

* Bone Phosphate.

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,046	Coast Line Ten Per Cent Guano.	Taylor & Treadwell, Norfolk, Va.	Berkley, Va.
1,152	"Ceres".	Hinton & Tolston, Mila, Va.	Mila, Va.
1,102	Cumberland Four Per Cent Guano.	D. H. Lindsey, Portsmouth, Va.	Duck Creek, Va.
1,252	Capitol Cotton Fertilizer.	S. W. Travers & Co., Richmond, Md.	Franklin, Va.
1,246	Champ's Prepared Chemicals.	Baugh & Sons Co., Baltimore, Md.	Petersburg, Va.
1,273	Champion Corn Grower.	S. W. Travers & Co., Richmond, Md.	Blackstone, Va.
1,360	Coon Brand Guano.	Patasco Guano Co., Baltimore, Md.	Wytheville, Va.
1,388	Corn and Oats.	Alexandria Fertilizer and Chemical Co., Alexandria, Va.	Warrenton, Va.
1,024	Double Ammoniated Truck Farmers' Special.	Wilcox & Gibbs Guano Co., Charleston, S. C.	Portsmouth, Va.
1,084	Derrick Ammoniated Bone.	Detrick Fertilizer and Chemical Co., Baltimore, Md.	Smithfield, Va.
1,085	Derrick Vegetable Compound.	Darling Fertilizer Co.	Smith Wharf, Va.
1,119	Darling Animal Guano.	Detrick Fertilizer and Chemical Co., Baltimore, Md.	Fredericksburg, Va.
1,152	Darling's Corn Fertilizer.	Durham Fertilizer Co., Durham, N. C.	Farmville, Va.
1,296	Durham Ammoniated Fertilizer with Peruvian Guano.	John S. Reese & Co., Baltimore, Md.	Danville, Va.
1,337	Danville High Grade.	Detrick Fertilizer and Chemical Co., Baltimore, Md.	Staunton, Va.
1,424	Detrick Ammoniated Bone	Griffith and Boyd, Baltimore, Md.	Winchester, Va.
1,453	Detrick Ammoniated Bone Superphosphate.	Rasin Fertilizer Co., Baltimore, Md.	Portsmouth, Va.
1,027	Excelsior Stable Manure Substitute.	Atlantic and Virginia Fertilizer Co., Richmond, Va.	Suffolk, Va.
1,166	Empire Guano.	Davie & Whittle, Petersburg, Va.	Wakefield, Va.
1,236	Eureka Ammoniated Bone Superphosphate.	Alexandria Fertilizer and Chemical Co., Alexandria, Va.	Waverly, Va.
1,243	Eagle Brand Guano.	Patasco Guano Company, Baltimore, Md.	Westend, Va.
1,244	Eagle Brand Guano.	Baltimore Guano Company,	Wilton, Va.
1,259	Excelsior Guano.	Atlantic and Virginia Fertilizer Company, Richmond, Va.	Chancellor, Va.
4,129	Early Trucker.	John S. Reese & Co., Baltimore, Md.	Williamsburg, Va.
1,147	Early Phosphate.	Atlanta Guano Company, Atlanta, Ga.	Pamplin, Va.
1,126	Eureka Ammoniated Bone Superphosphate.	Alexandria Fertilizer and Chemical Co., Alexandria, Va.	Lynchburg, Va.
1,301	Excellenza Soluble Guano.	Rasin Fertilizer Company, Baltimore, Md.	South Boston, Va.
1,310	Eddystone.	Atlantic and Virginia Fertilizer Company, Richmond, Va.	Danville, Va.
1,324	Excelsior Guano.		Winchester, Va.
1,335	Empire		Roanoke, Va.
1,456	Eureka Ammoniated Bone Superphosphate.		

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.			GUARANTEE IN DEPARTMENT.			ANALYSIS BY CHEMIST.							Relative commercial value per ton of ingredients at seaboard.			
		Avail. Phos. Acid.	Ammonia.	Potash.	Insol. Phos. Acid.	Avail. Phos. Acid.	Ammonia.	Potash.	Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Revised Phos. Acid.	Avail. Phos. Acid.	Nitrogen.	Equiv. to Ammonia.	Potash.	By Guarantee.	By Analysis.
1,046	Coast Line Ten Per Cent Guano.....	5.00	10.00	3.00	.....	5.00	10.00	3.00	8.20	32	4.80	2.04	6.84	7.69	9.34	3.36	\$8.00	\$8.22
1,132	"Ceres".....	8.36	3.88	1.03	.....	8.36	3.88	1.03	12.20	2.81	6.65	1.79	8.44	2.77	3.31	2.86	16.82	21.41
1,102	Cumbrland Four Per Cent Guano.....	.....	.....	.....	4.00	.....	4.00	4.00	9.00	4.09	3.10	1.83	4.93	3.91	4.75	4.28	16.00	23.46
1,232	Capitol Cotton Fertilizer.....	8.00	2.00	2.00	.....	8.00	2.00	2.00	10.60	2.00	7.10	1.60	8.70	1.78	2.17	2.20	16.00	17.41
1,246	Camp's Prepared Chemicals.....	4.00	3.30	.80	.....	4.00	3.30	.80	8.00	3.07	2.90	2.41	6.31	2.69	3.28	1.00	14.70	16.15
1,273	Champion Corn Grower.....	8.00	1.00	2.00	.....	8.00	1.00	2.00	11.60	1.85	6.85	1.28	8.13	1.39	1.69	1.78	13.00	14.98
1,360	Coon Brand Guano.....	8.00	1.00	2.00	.....	8.00	1.00	2.00	12.50	1.54	7.05	3.12	10.17	1.40	1.70	2.62	13.00	17.89
1,381	Corn and Oats.....	8.00	2.00	2.00	.....	8.00	2.00	2.00	8.80	1.85	7.85	1.49	9.34	1.83	2.22	1.62	16.00	18.20
1,024	Double Ammo. Truck Farmers' Special.....	8.25	8.25	4.25	.....	8.25	8.25	4.25	15.00	.....	8.25	1.22	9.47	6.74	8.19	4.94	37.25	38.98
1,084	Detrick Ammoniated Bone.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	12.80	3.33	4.75	3.33	8.12	1.82	2.21	1.46	15.50	16.21
1,086	Detrick Vegetable Compound.....	7.00	7.00	4.00	.....	7.00	7.00	4.00	11.80	1.28	6.95	1.18	8.13	4.49	5.58	5.48	31.00	28.04
1,119	Detrick's Corn Fertilizer.....	10.00	10.00	4.00	.....	10.00	10.00	4.00	6.80	4.99	1.40	1.18	3.78	7.07	8.58	5.48	35.00	35.00
1,162	Durham Ammo. Fert. with Peruvian Guano.....	8.00	1.00	2.00	.....	8.00	1.00	2.00	11.60	2.23	6.70	3.61	10.31	1.08	1.32	2.36	17.50	17.31
1,286	Durham High Grade.....	8.50	2.50	2.10	.....	8.50	2.50	2.10	10.80	2.05	8.45	5.06	8.95	1.65	2.06	2.36	20.00	20.91
1,337	Detrick Ammoniated Bone.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	9.60	3.77	7.15	2.98	10.13	1.98	2.40	1.72	15.50	19.05
1,424	Detrick Ammoniated Bone.....	9.00	1.50	1.00	.....	9.00	1.50	1.00	10.20	4.79	5.85	4.24	10.99	1.54	1.87	1.58	14.50	17.28
1,453	Detrick Stable Manure Substitute.....	5.00	3.50	4.00	.....	5.00	3.50	4.00	14.20	2.68	5.55	7.92	6.27	2.89	3.52	4.82	19.50	21.65
1,027	Excelsior Stable Manure Substitute.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	14.80	2.49	6.78	1.60	8.38	2.11	2.56	1.82	15.50	17.88
1,106	Empire Guano.....	8.00	2.00	2.00	.....	8.00	2.00	2.00	8.80	2.05	3.60	5.60	9.20	2.07	2.52	2.72	16.00	19.50
1,286	Eureka Ammo. Bone Superphosphate.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	8.40	2.17	5.85	1.70	7.55	1.62	1.97	1.46	15.00	15.01
1,243	Eagle Brand Guano.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	7.60	3.07	6.20	3.60	9.24	1.85	2.24	2.12	17.50	18.45
1,244	Eagle Brand Guano.....	8.00	2.50	2.00	.....	8.00	2.50	2.00	11.60	4.15	7.20	2.41	9.61	1.85	2.24	2.12	17.50	18.45
1,259	Excelsior Guano.....	8.00	2.00	4.00	.....	8.00	2.00	4.00	12.20	2.36	5.50	1.86	7.36	3.68	4.46	4.68	26.00	25.42
1,129	Early Truckee.....	7.00	5.00	4.00	.....	7.00	5.00	4.00	12.20	2.36	5.50	1.86	7.36	3.68	4.46	4.68	26.00	25.42
1,187	Eagle Phosphate.....	10.00	5.00	1.00	.....	10.00	5.00	1.00	11.00	3.19	7.21	1.55	10.18	1.76	2.14	1.72	12.50	14.68
1,263	Eureka Ammo. Bone Superphosphate.....	8.01	2.00	2.00	.....	8.00	2.00	2.00	8.60	2.94	6.90	1.85	8.45	1.76	2.14	1.72	12.50	14.68
1,301	Eureka Ammo. Bone Superphosph for Tobacco.....	8.50	2.50	2.00	.....	8.50	2.50	2.00	11.70	1.66	8.95	8.05	11.00	2.66	3.24	2.54	18.50	23.25
1,310	Excellenza Soluble Guano.....	8.50	2.75	1.20	.....	8.50	2.75	1.20	9.80	1.60	4.15	5.64	9.79	1.90	2.31	1.34	17.95	17.95
1,324	Eddystone Soluble Guano.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	15.20	3.25	5.60	8.39	8.89	1.90	2.31	1.04	15.00	16.86
1,335	Excelsior Guano.....	8.00	2.50	2.00	.....	8.00	2.50	2.00	12.00	3.01	7.65	1.50	9.15	2.37	2.88	1.40	17.50	19.19
1,456	Empire Guano.....	8.00	2.43	1.50	.....	8.00	2.43	1.50	12.40	3.97	6.60	2.55	9.15	2.12	2.58	1.75	16.89	18.64
1,505	Eureka Ammo. Bone Superphosphate.....	8.00	2.00	2.00	.....	8.00	2.00	2.00	10.60	3.07	7.90	1.76	9.66	1.40	1.70	1.86	16.00	16.62

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,034	Fish Bone and Potash.....	Baltimore Guano Company, Baltimore, Md.....	Norfolk, Va.
1,093	Freeman's Irish Potato Grower.....	E. H. Freeman & Co., Norfolk, Va.....	Norfolk, Va.
1,093	Farmers' Acme Fertilizer.....	M. P. Hubbard & Co., Baltimore, Md.....	Hampton, Va.
1,103	"F. C." Farmers' Challenge Guano.....	Charles Reid & Sons, Norfolk, Va.....	Portsmouth, Va.
1,095	Freeman's Ten Per Cent Early Truck Guano.....	E. B. Freeman & Co., Norfolk, Va.....	Norfolk, Va.
1,097	Farmer & Co.'s Manure Substitute.....	W. S. Farmer & Co., Baltimore, Md.....	"
1,054	Freeman's Ten Per Cent Early Truck Guano.....	E. B. Freeman & Co., Norfolk, Va.....	"
1,056	"Seven Per Cent Early Truck Guano.....	"	Smithfield, Va.
1,058	"F. C." Ten Per Cent Farmers' Challenge.....	Charles Reid & Sons, Norfolk, Va.....	Smithfield, Va.
1,104	Farmers' "I. X. L." Superphosphate.....	Hubbard & Co., Baltimore, Md.....	Portsmouth, Va.
1,109	"	"	Suffolk, Va.
1,139	"	"	Saluda, Va.
1,163	"	"	Ethel, Va.
1,172	"	"	Nandua, Va.
1,128	Friend Fertilizer.....	S. Grinels & Son, Grinels, Va.....	Grinels, Va.
1,141	Reliance Mixture.....	Baugh & Sons Co., Baltimore, Md.....	Franklin, Va.
1,180	Friend Fertilizer.....	J. H. Nichols, Baltimore, Md.....	Cedarview, Va.
1,185	Fish Mixture Guano.....	Baltimore Guano Company, Baltimore, Md.....	Onancock, Va.
1,200	F. H. Dryden's Superphosphate.....	Tyger-Allen Fertilizer Company, Philadelphia, Pa.....	Parkley, Va.
1,222	F. T. Bogg's Special Sweet Potato Mixture.....	Baltimore Guano Company, Baltimore, Md.....	Bogg's Wharf, Va.
1,263	Farmers' Union Special Tobacco Guano.....	Old Dominion Guano Company, Norfolk, Va.....	Blackstone, Va.
1,292	"I. X. L." Superphosphate.....	Hubbard & Co., Baltimore, Md.....	Farmville, Va.
1,339	"Soluble Bone High Grade Tobacco Manure.....	Old Dominion Guano Company, Norfolk, Va.....	Danville, Va.
1,366	Favorite Fertilizer.....	Baltimore Pulverizing Company, Baltimore, Md.....	Roanoke, Va.
1,465	"	"	Winchester, Va.
1,496	"	"	Roanoke, Va.
1,069	Griffith & Boyd's Special Ten Per Cent Truck Phosphate.....	Griffith & Boyd, Baltimore, Md.....	Portsmouth, Va.
1,070	"Special Potato Manure.....	"	"
1,071	"Excelsior Stable Manure Substitute.....	"	"
1,115	"Excelsior Stable Manure Substitute.....	"	"
1,125	"Gold Basis".....	Woodbridge Fertilizer Company, Baltimore, Md.....	Flora Point, Sassafras, Va.
1,116	Griffith & Boyd's Special Ten Per Cent Truck.....	Griffith & Boyd.....	Flora Point.

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

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ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,188	Genuine Lobos Peruvian Guano.....	Baugh & Sons' Company, Baltimore, Md.....	Quancock.
1,207	Gold Edge Potato Guano.....	Tygart-Allen Fertilizer Company, Philadelphia, Pa.....	Bloxious, Va.
1,248	Globe Complete Manure.....	Maryland Fertilizer and Manufacturing Co., Baltimore, Md.....	Petersburg.
1,376	Great Wheat and Corn Grower.....	Durham Fertilizer Company, Durham, N. C.....	Arrington.
1,430	Grange Mixture Dissolved Bone Phosphate.....	Patapasco Guano Company, Baltimore, Md.....	Stadon.
1,432	Grain and Grass Producer.....	Patapasco Guano Company, Baltimore, Md.....	Roseton.
1,506	Griffith & Boyd's Cereal Bone Plant Food.....	Griffith & Boyd, Baltimore, Md.....	Wytheville.
1,522	Great Wheat and Grass Producer.....	Durham Fertilizer Company, Durham, N. C.....	Woodstock.
1,474	Grain and Grass Producer.....	Patapasco Guano Company, Baltimore, Md.....	Berkley.
1,911	High Grade Premium Guano.....	George L. Arps, Norfolk, Va.....	Portsmouth.
984	Hubbard's Bermuda Guano.....	M. P. Hubbard & Co., Baltimore, Md.....	Portsmouth.
985	" Celebrated Bone Phosphate.....	Hubbard & Co., Baltimore, Md.....	Norfolk.
996	" Standard Bone.....	Lazaretto Guano Co., Baltimore, Md.....	Berkley.
1,082	Home's Gold Dust Guano.....	American Fertilizer Company, Norfolk, Va.....	Pinner's Point.
1,091	High Grade Special Formula.....	American Fertilizer Company, Norfolk, Va.....	Portsmouth.
1,041	High Grade Special Formula.....	M. P. Hubbard & Co., Baltimore, Md.....	Hampton.
1,092	Hubbard's Bermuda Guano.....	Woodridge Fertilizer Company, Baltimore, Md.....	White Marsh.
1,120	Honest Dollar Bone Phosphate.....	Hubbard & Co., Baltimore, Md.....	Gloucester Point.
1,122	Hubbard's Standard Bone Superphosphate.....	American Fertilizer Company, Norfolk, Va.....	Churchland.
1,117	High Grade Formula Guano.....	M. P. Hubbard & Co., Baltimore, Md.....	Kilmarnock.
1,131	Hubbard's Celebrated Bone Superphosphate.....	Hubbard & Co., ".....	Saluda.
1,132	" Standard.....	".....	Tappahannock.
1,168	".....	".....	Triperanceville.
1,217	Harvest Queen.....	W. S. Farmer & Co., ".....	Blackstone.
1,266	Highland Corn Guano.....	Blackstone Guano Company, Blackstone, Va.....	Farmville.
1,291	Horseshoe Brand Tobacco Grower.....	Northwestern Fertilizer Company, Chicago, Ill.....	South Boston.
1,320	Hill's Corn Grower.....	John R. Hill, South Boston, Va.....	"
1,321	" Alliance High Grade.....	".....	"
1,322	" Bright Tobacco Guano.....	".....	"
1,323	" Bright Tobacco Guano, No. 2.....	".....	"
1,372	Horseshoe Brand Tobacco Grower.....	Northwestern Fertilizer Company, Chicago, Ill.....	Bedford City.
1,373	Hard Times Fertilizer.....	W. B. Griffith, Baltimore, Md.....	Bedford City.

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.			GUARANTEE IN DEPARTMENT.				ANALYSIS BY CHEMIST.						Relative commercial value per ton of ingredients at seaboard.				
		Avall. Phos. Acid.	Ammonia.	Potash.	Insol. Phos. Acid.	Avall. Phos. Acid.	Ammonia.	Potash.	Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Revised Phos. Acid.	Avall. Phos. Acid.	Nitrogen.	Equiv. to Ammonia.	Potash.	By Guarantee.	By Analysis.	
1,188	Genuine Lobos Peruvian Guano.....	6.00	3.00	5.00	.....	18.00	.....	9.00	14.20	7.93	1.75	1.75	11.56	13.31	2.65	2.23	2.44	\$26.00	\$25.44
1,207	Gold Edge Potato Guano.....	9.00	1.75	1.50	.....	6.00	.....	6.00	9.00	1.92	4.12	4.12	2.53	6.65	2.77	3.37	4.82	20.00	21.58
1,248	Globe Complete Manure.....	10.00	1.50	1.50	.....	9.00	.....	1.75	11.00	3.97	6.65	6.65	1.86	8.51	1.71	2.07	2.16	13.75	16.88
1,376	Great Wheat and Corn Grower.....	10.00	1.50	1.50	.....	10.00	.....	1.50	11.00	2.00	10.95	10.95	1.66	10.95	1.82	.99	1.20	16.00	17.03
1,430	Grange Mature Dissolved Bone Phosphate.....	10.00	2.00	2.00	.....	10.00	.....	2.00	11.40	2.17	9.05	9.05	1.12	10.17	1.90	2.29	1.58	17.50	18.62
1,432	Grain and Grass Product.....	10.00	1.00	2.00	.....	10.00	.....	1.00	11.80	1.41	9.30	1.38	1.08	1.46	1.78	1.82	1.50	17.84	18.42
1,506	Griffin & Boyd's Cereal Bone Plant Food.....	8.00	1.25	1.50	.....	8.00	.....	1.25	11.60	2.57	6.65	.81	7.30	1.20	1.46	1.70	1.35	13.25	13.61
1,522	Great Wheat and Grass Grower.....	10.00	.50	1.50	.....	10.00	.....	1.50	11.60	1.31	9.30	2.05	1.65	10.75	1.52	.33	1.04	13.00	13.36
1,574	Grain and Grass Product.....	10.00	1.00	2.00	.....	10.00	.....	1.00	12.00	1.79	9.10	1.65	1.79	9.10	1.84	1.59	1.80	17.86	18.12
1,611	Hubbard's Premium Guano.....	8.00	2.00	1.50	.....	7.00	.....	3.00	14.80	2.17	6.70	2.38	9.08	1.20	1.52	1.36	1.96	15.50	18.12
884	Hubbard's Bermuda Guano.....	7.00	7.00	3.00	.....	7.00	.....	7.00	9.20	1.92	6.50	3.00	7.80	4.35	5.28	3.94	3.10	28.34	31.00
885	" Celebrated Bone Phosphate.....	9.00	2.50	2.00	.....	9.00	.....	2.50	10.60	3.07	6.36	2.59	8.95	2.00	2.43	2.48	18.50	18.72	
996	" Standard Bone.....	9.00	2.00	2.00	.....	9.00	.....	2.00	10.60	1.78	6.52	2.31	8.53	1.46	1.78	2.66	1.77	16.22	17.00
1,082	Home's Gold Dust Guano.....	8.00	2.00	2.00	.....	8.00	.....	2.00	12.80	2.05	7.65	1.37	9.02	1.70	2.06	1.52	1.70	16.22	17.00
1,091	High Grade Special Formula.....	8.00	10.00	5.00	.....	8.00	.....	10.00	5.00	6.20	6.70	1.17	7.87	8.32	10.10	6.52	4.30	44.69	48.00
1,091	High Grade Special Formula.....	8.00	10.00	5.00	.....	8.00	.....	10.00	5.00	6.20	6.70	1.17	7.87	8.32	10.10	6.52	4.30	44.69	48.00
1,092	Hubbard's Bermuda Guano.....	7.00	7.00	3.00	.....	7.00	.....	7.00	9.00	11.60	1.28	3.00	1.55	9.85	6.56	7.97	4.86	30.00	32.84
1,120	Honest Dollar Bone Phosphate.....	8.00	3.50	2.00	.....	8.00	.....	3.50	7.00	10.40	2.05	6.15	1.67	6.72	5.96	6.15	4.04	31.00	29.94
1,122	Hubbard's Standard Bone Superphosphate.....	8.00	2.00	2.00	.....	8.00	.....	2.00	12.00	1.66	7.20	1.50	8.70	1.08	3.41	6.38	2.95	20.91	25.94
1,131	Hubbard's Standard Bone Superphosphate.....	8.00	2.00	2.00	.....	8.00	.....	2.00	12.00	1.66	7.20	1.50	8.70	1.08	3.41	6.38	2.95	20.91	25.94
1,138	Hubbard's Standard Bone Superphosphate.....	9.00	2.50	2.00	.....	9.00	.....	2.50	10.00	1.28	6.85	2.86	5.61	9.33	2.81	4.04	2.02	17.00	17.44
1,162	" Standard ".....	9.00	2.00	2.00	.....	9.00	.....	2.00	13.40	3.84	6.55	1.00	7.55	2.28	2.77	2.54	15.50	17.87	
1,217	Harvest Queen.....	9.00	2.00	2.00	.....	9.00	.....	2.00	11.40	1.79	7.65	2.20	9.34	2.28	2.77	2.70	15.00	17.87	
1,266	Highland Corn Guano.....	10.00	1.50	2.50	.....	10.00	.....	1.50	11.00	2.30	6.60	3.17	8.77	1.90	1.25	1.52	3.16	17.00	18.30
1,293	Horseshoe Brand Tobacco Grower.....	7.00	3.00	1.08	.....	7.00	.....	3.00	9.80	2.49	8.24	3.09	11.33	.93	1.14	1.70	15.00	16.45	
1,320	Hill's Corn Grower.....	7.00	1.00	2.00	.....	7.00	.....	1.00	12.00	5.31	6.00	2.48	7.48	3.31	1.82	1.77	17.08	19.23	
1,321	" Alliance High Grade.....	7.50	1.50	1.25	.....	7.50	.....	1.50	8.60	2.43	5.85	1.70	7.10	1.31	1.59	3.24	12.00	15.11	
1,322	" Bright Tobacco Guano.....	8.50	2.25	2.25	.....	8.50	.....	2.25	9.20	2.17	6.40	3.68	9.98	2.48	2.52	2.52	17.64	19.38	
1,372	Horseshoe Brand Tobacco Guano, No. 2.....	8.00	2.00	2.00	.....	8.00	.....	2.00	9.20	2.05	5.20	3.94	1.44	2.95	1.96	1.96	16.00	17.85	
1,373	Hard Times Fertilizer.....	7.00	3.00	1.00	.....	7.00	.....	3.00	16.60	5.05	4.90	2.64	7.74	2.96	3.59	2.94	16.00	18.59	
1,373	Hard Times Fertilizer.....	7.00	1.50	1.00	.....	7.00	.....	1.50	11.00	2.62	6.00	1.70	7.80	1.43	1.73	1.74	18.50	14.39	

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.			GUARANTEE IN DEPARTMENT.			ANALYSIS BY CHEMIST.							Relative commercial value per ton of ingredients at seaboard.				
								Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Revd. Phos. Acid.	Avall. Phos. Acid.	Nitrogen.	Equiv. to Ammonia.	Potash.	By Guarantee.	By Analysis.		
		Avall. Phos. Acid.	Ammonia.	Potash.	Insol. Phos. Acid.	Avall. Phos. Acid.	Potash.												
1,482	H. S. Roberts & Co's Super A Guano.....	7.50	.75	1.00				7.50	.75	1.00	2.30	3.60	3.60	7.40	.89	1.09	2.02	11.75	12.78
1,483	" " Gov'nor Am. & Con. Guano.....	9.00	1.50	2.50				9.00	1.50	2.50	1.34	8.10	1.12	9.22	1.69	2.06	2.16	16.00	17.53
1,484	" " Leader Guano.....	8.00	1.00	1.50				8.00	1.00	1.50	1.92	6.60	1.53	8.13	1.28	1.55	1.66	12.50	14.44
1,485	High Grade Bone Superphosphate.....	8.00	1.50	1.00				8.00	1.50	1.00	8.40	3.45	8.40	4.3	8.83	1.19	1.54	13.50	14.72
1,486	Imperial Fish and Bone.....	6.00	4.00	3.00				6.00	4.00	3.00	11.80	3.58	3.35	6.65	4.54	6.62	4.81	20.00	28.03
1,022	Guanco for Potatoes.....	6.00	9.00	6.00				6.00	9.00	6.00	10.20	2.94	3.10	1.88	5.03	10.43	5.80	38.00	42.12
1,066	" " Ten Per Cent Guano.....	6.00	10.00	3.50				6.00	10.00	3.50	9.00	2.75	5.60	1.70	7.30	7.29	8.87	39.50	38.85
1,067	" " Guano for Corn and Peanuts.....	8.00	2.00	1.50				8.00	2.00	1.50	13.80	2.23	6.75	2.02	8.77	2.09	2.54	18.50	18.21
1,072	" " Seven Per Cent Guano for Potatoes.....	7.00	7.00	6.00				7.00	7.00	6.00	9.80	3.33	4.55	2.74	7.29	6.88	7.14	33.50	34.50
1,073	" " Ten Per Cent Guano.....	6.00	10.00	3.50				6.00	10.00	3.50	11.40	2.43	3.20	2.59	5.89	9.57	3.90	38.40	38.40
1,104	" " Fish and Bone.....	6.00	4.00	3.00				6.00	4.00	3.00	10.40	3.51	2.20	4.62	3.40	4.12	4.64	21.00	21.62
1,120	" " Guano for Peanuts.....	8.00	2.00	1.50				8.00	2.00	1.50	12.80	1.47	7.05	1.33	8.38	2.04	3.02	13.50	18.48
1,125	" " Seven Per Cent Guano.....	7.00	7.00	3.00				7.00	7.00	3.00	10.60	3.71	1.14	7.29	6.02	7.31	3.44	31.00	32.66
1,138	J. D. Belote's Special Sweet Potato Fertilizer.....	8.00	4.00	4.00				8.00	4.00	4.00	9.00	7.30	2.48	9.78	3.29	4.00	3.06	24.00	24.84
1,161	Kangaroo Complete Compound.....	6.00	1.35	4.00				6.00	1.35	4.00	6.60	4.35	3.50	4.81	1.36	1.65	5.06	14.05	19.32
1,215	" " Kangaroo Complete Compound.....	6.00	1.35	4.00				6.00	1.35	4.00	8.80	6.08	3.05	3.79	6.84	1.68	5.64	14.05	17.52
1,214	King Philip's Guano.....	8.00	1.50	3.00				8.00	1.50	3.00	15.00	2.87	2.20	4.21	6.41	1.57	1.91	13.50	15.30
1,383	Kangaroo Complete Comp. and Ketocitin's Ammoniated Dissolved Bone.....	8.00	2.00	2.00				8.00	2.00	2.00	7.00	5.82	6.05	1.95	8.00	1.83	2.22	16.00	16.60
1,382	Lister's Ammoniated Dissolved Bone.....	9.00	2.20	1.50				9.00	2.20	1.50	13.00	1.98		9.27	2.00	2.44	2.20	16.00	18.79
990	" " Harvest Queen Phosphate.....	9.50	1.50	2.00				9.50	1.50	2.00	14.70	2.30		9.47	1.76	2.64	3.58	17.50	21.61
991	" " Std Pure Bone Su ^t phosphate of Lime.....	10.00	2.85	1.50				10.00	2.85	1.50	12.40	4.22	6.92	2.91	8.83	2.47	3.00	19.60	20.99
997	" " Vegetable Compound.....	7.75	4.50	7.00				7.75	4.50	7.00	14.80	.77		7.67	3.69	4.63	8.04	28.50	26.30
998	" " Special Seven Per Cent Potato Guano.....	5.00	7.00	5.00				5.00	7.00	5.00	13.00			6.86	8.19	5.03	6.16	31.00	31.49
999	" " Special High Grade 10 Per Cent Guano.....	6.00	10.00	4.00				6.00	10.00	4.00	11.80			6.52	9.04	9.04	5.14	40.00	39.17
1,190	Lewis' Ball Crown Mixture Guano.....	9.00	3.00	3.00				9.00	3.00	3.00	10.20			4.38	10.88	2.23	2.71	21.00	21.83
1,145	Lister's Standard Pure Bone Superphosphate.....	10.00	2.85	1.50				10.00	2.85	1.50	15.20	2.94	8.50	1.80	10.30	2.39	4.24	20.05	21.24
1,146	" " Ammoniated Di ^t . Bone Superphosph. Stand. Pure Bone Superphos. of Lime.....	9.00	2.20	1.50				9.00	2.20	1.50	16.40	2.11	8.40	1.45	9.80	1.76	2.13	17.10	18.20
1,242	" " Stand. Pure Bone Superphos. of Lime.....	12.00	2.85	1.50				10.00	2.85	1.50	3.84	7.10	1.92	9.02	3.01	3.66	2.08	23.05	22.08
1,399	Lodge's Formula.....	10.00	1.50	12.00				10.00	1.50	12.00	1.54	9.20	1.41	10.61	.61	.74	2.32	13.50	15.15
1,088	Mape's Manure for Potatoes.....	8.00	4.50	6.00				8.00	4.50	6.00	3.20	1.01	7.16	1.41	7.16	4.40	6.84	20.50	20.90
1,087	Mt. Airy Garden and Truck Fertilizer.....	8.00	3.00	3.00				8.00	3.00	3.00	8.40	1.98		8.40	2.53	3.07	2.94	27.00	29.00

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,098	Mt. Airy Garden and Truck Fertilizer.....	The Mt. Airy Manufacturing Co., Baltimore, Md.....	Hampton, Va.
1,099	" " Guano for Potatoes.....	H. W. May & Son, Alexandria, Va.....	Mount Holly, Va.
1,099	May's Fish Fertilizer.....	Taylor & Treadwell, Norfolk, Va.....	Berkley
1,253	Norfolk Truckers' Reliance.....	A. J. Newton, Norfolk, Va.....	J. H. Bidgood's Farm.
1,045	Newton's Guano.....	Taylor & Treadwell, Norfolk, Va.....	Berkley
1,101	Norfolk Truckers' Reliance.....	Baugh & Sons Co., Baltimore, Md.....	Bloxon's
1,103	Norfolk Truckers' Reliance.....	Sharpless & Carpenter, Philadelphia, Pa.....	Exmore
1,209	No. 1 Peruvian Guano.....	S. W. Travers & Co., Richmond, Va.....	Blackstone.
1,227	No. 1 Bone Phosphate.....	Durham Fertilizer Company, Durham, N. C.....	"
1,272	National Tobacco Fertilizer.....	Durham Fertilizer Company, Durham, N. C.....	Danville.
1,277	North Carolina Official Farmers' Alliance Guano.....	S. W. Travers & Co., Richmond, Va.....	Richmond
1,329	North Carolina Official Farmers' Alliance Guano.....	Davis & Whittle, Petersburg, Va.....	Smithfield.
1,356	National Tobacco Fertilizer.....	Humphreys & Thigman, Salisbury, Md.....	Keller.
1,068	Owl Brand Guano.....	Baugh & Sons Co., Baltimore, Md.....	Nandua
1,164	Our Fish Mixture "F".....	Baugh & Sons Co., Baltimore, Md.....	Bogg's Wharf.
1,165	Our Fish Mixture "B".....	Davis & Whittle, Petersburg, Va.....	Conrad
1,177	Onancock Fertilizer, A No. 2.....	Davis & Whittle, Petersburg, Va.....	Blackstone.
1,223	Onancock Fertilizer, A No. 2.....	The Chesapeake Guano Company, Baltimore, Md.....	"
1,235	Owl Brand Guano.....	G. Ober & Sons Co., Baltimore, Md.....	Farmville.
1,267	Owl Brand Special Tobacco Guano.....	Clement, Carrington & Co., Lynchburg, Va.....	"
1,270	Orole High Grade Fertilizer.....	Clement, Carrington & Co., Lynchburg, Va.....	Farmville.
1,280	Orole's Standard Tobacco Fertilizer.....	Hubbard & Co., Baltimore, Md.....	Danville.
1,283	Old Chief Tobacco Guano.....	Old Dominion Guano Company, Norfolk, Va.....	Blackstone.
1,284	Old Chief Tobacco Guano.....	Old Dominion Guano Company, Norfolk, Va.....	Danville.
1,294	Oriental Phosphate for Wheat.....	Davis & Whittle, Petersburg, Va.....	"
1,334	Old Chief Brand for Tobacco.....	Chesapeake Guano Company.....	"
1,276	Old Dominion Soluble Tobacco Guano.....	Davis & Whittle, Petersburg, Va.....	Chatham.
1,340	Old Dominion Soluble Tobacco Guano.....	Davis & Whittle, Petersburg, Va.....	Winchester.
1,342	Orole Brand Guano.....	G. Ober & Sons Co., Baltimore, Md.....	Woodstock.
1,343	Orole High Grade Fertilizer.....	G. Ober & Sons Co., Baltimore, Md.....	
1,349	Orole's Standard Tobacco Guano.....		
1,446	Orole's Dissolved Bone.....		
1,481	Orole's Farmers' Standard Ammoniated Phosphate.....		

ANALYSES OF FERTILIZERS.—TABLE NO. 1.—Continued.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,002	Pocomoke Superphosphate.....	E. B. Freeman & Co., Norfolk, Va.....	Norfolk.
1,052	" ".....	" ".....	Norfolk.
1,057	" ".....	" ".....	Smithfield.
1,087	Potato and Truck Fertilizer.....	Detrick Fertilizer and Chem. Company, Baltimore, Md.....	Windor.
1,090	Powell's Prepared Chemicals.....	W. S. Powell & Co., Baltimore, Md.....	Franklin.
1,113	Patapasco Guano.....	Patapasco Guano Company, Baltimore, Md.....	Franklin.
1,137	" Ammoniated Corn Fertilizer.....	" ".....	Norfolk.
1,229	" Guano.....	" ".....	Franklin.
1,230	Peruvian Mixture.....	American Fertilizer Company, Norfolk, Va.....	Franklin.
1,231	Piedmont Guano for Truck.....	M. A. Freeman & Co., Norfolk, Va.....	Norfolk.
1,231	Pocomoke Superphosphate.....	E. B. Freeman & Co., Norfolk, Va.....	Franklin.
1,233	Flow Brand Raw Bone Superphosphate.....	Walton and Whelan Company, Wilmington, Del.....	Franklin.
1,247	Patapasco Tobacco Fertilizer.....	Patapasco Guano Company, Baltimore, Md.....	Petersburg.
1,249	Powell's Prepared Chemicals.....	W. S. Powell & Co., Baltimore, Md.....	Petersburg.
1,252	Potmac Ammoniated Superphosphate.....	P. Macdonald & Co., Baltimore, Md.....	West Wharf.
1,257	Potato Phosphate.....	Stonewall Fertilizer Company, D. C.....	Alexandria.
1,260	Process Ammoniated Bone Superphosphate.....	Alexandria Fertil. and Chem. Company, Alexandria, Va.....	West End.
1,285	Potomac Special Tobacco Fertilizer.....	Clement, Carrington & Co., Lynnhaven, Va.....	Farmville.
1,291	Peter's Ammoniated Discolored Bone.....	M. P. Hubbard & Co., Baltimore, Md.....	Farmville.
1,319	Progressive Farmer Guano.....	Clarian Fertilizer Company, Durham, N. C.....	South Boston.
1,333	Pocahontas Special Tobacco Fertilizer.....	Clement, Carrington & Co., Lynnhaven, Va.....	Deville.
1,346	Piedmont Guano for Tobacco.....	Mt. Airy Manufacturing Company, Baltimore, Md.....	"
1,347	Pine Island Guano.....	Quinnipiac Guano Company, New York City.....	Chatham.
1,348	Premium Brand Tobacco Guano.....	Quinnipiac Guano Company, New York City.....	Abingdon.
1,353	Peter's Ammoniated Bone and Potash.....	M. P. Hubbard & Co., Baltimore, Md.....	Wynneville.
1,361	Patapasco Ammoniated Corn Fertilizer.....	Patapasco Guano Company, Baltimore, Md.....	Norfolk.
1,393	Patapasco Guano.....	Patapasco Guano Company, Baltimore, Md.....	Windsor.
1,409	Piedmont Pure Raw Bone Mixture.....	Patapasco Guano Company, Baltimore, Md.....	Windsor.
1,487	Pellock's Special Waxed Mix for Tobacco.....	R. H. Pollock & Co., Baltimore, Md.....	Front Royal.
1,488	Pellock's Ammoniated Bone Superphosphate.....	R. H. Pollock & Co., Baltimore, Md.....	Norfolk.
985	Royal Seal Compound.....	Hubbard & Co., Baltimore, Md.....	Windsor.
1,110	Richmond Brand.....	James G. Tinsley & Co., Richmond, Va.....	Windsor.

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.			GUARANTEE IN DEPARTMENT.			ANALYSIS BY CHEMIST.							Relative commercial value per ton of ingredients at seaboard.			
		Avail. Phos. Acid.	Ammonia.	Potash.	Insol. Phos. Acid.	Avail. Phos. Acid.	Ammonia.	Potash.	Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Rev'd Phos. Acid.	Avail. Phos. Acid.	Nitrogen.	Equity to Ammonia.	Potash.	By Guarantee.	By Analysis.
1,002	Pocomoke Superphosphate.....	8.50	2.00	1.50	.....	8.50	2.00	1.50	14.40	1.92	7.20	1.37	8.57	1.73	2.11	2.19	16 00	17 06
1,052	"	8.50	2.00	1.50	.....	8.50	2.00	1.50	11.80	1.00	6.70	2.57	9.27	1.78	2.17	1.90	16 00	17 68
1,057	"	8.50	2.00	1.50	.....	8.50	2.00	1.50	15.60	8.35	6.65	2.06	9.27	1.78	2.17	2.32	17 54	17 54
1,087	Potato and Truck Fertilizer.....	8.00	4.00	4.00	.....	8.00	4.00	4.00	14.40	1.83	7.10	2.12	9.22	3.02	3.67	4.12	24 00	24 35
1,090	Powell's Prepared Chemicals.....	9.25	2.50	1.25	.....	9.25	2.50	1.25	10.00	.....	7.48	1.68	9.08	2.11	2.56	1.86	18 00	21 05
1,113	Papasco Guano.....	9.25	2.50	1.25	.....	9.25	2.50	1.25	14.20	1.98	7.48	1.68	9.08	2.11	2.56	1.86	18 00	18 86
1,137	"	9.00	1.50	1.50	.....	9.00	1.50	1.50	12.00	2.17	7.75	1.99	9.79	2.07	2.52	3.08	18 00	18 95
1,229	"	9.25	2.50	1.25	.....	9.25	2.50	1.25	12.00	2.05	6.95	1.72	7.07	1.90	2.31	1.90	15 50	16 50
1,229	Ammoniated Corn Fertilizer.....	9.00	1.50	1.50	.....	9.00	1.50	1.50	8.00	3.32	8.00	3.32	8.00	4.31	3.32	1.90	15 50	16 50
1,229	Potomac Ammoniated Superphosphate.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	11.00	1.66	8.00	1.59	9.69	1.65	2.10	1.46	16 00	17 06
1,250	Piedmont Guano for Truck.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	12.40	2.49	7.25	2.03	9.28	2.07	2.52	2.52	21 00	19 49
1,251	Pocomoke Superphosphate.....	9.00	3.25	2.25	.....	9.00	3.25	2.25	12.40	2.49	7.25	2.03	9.28	2.07	2.52	2.52	21 00	19 49
1,253	Plow Brand Raw Bone Superphosphate.....	9.00	3.00	3.00	.....	9.00	3.00	3.00	11.20	1.70	8.75	3.00	12.35	2.44	2.97	2.74	21 00	24 00
1,247	Papasco Tobacco Fertilizer.....	9.00	3.00	3.00	.....	9.00	3.00	3.00	8.20	.....	8.75	3.00	12.35	2.44	2.97	2.74	21 00	21 53
1,249	Powell's Prepared Chemicals.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	17.00	3.58	4.50	1.45	10.45	1.68	2.04	1.50	15 50	13 57
1,252	Potomac Ammoniated Superphosphate.....	8.00	2.00	1.50	.....	8.00	2.00	1.50	9.00	3.07	9.10	1.32	10.42	1.78	2.17	2.66	19 00	19 59
1,257	Potato Phosphate.....	10.00	3.00	3.00	.....	10.00	3.00	3.00	1.50	8.80	2.30	8.15	2.55	10.70	2.50	3.04	22 10	22 10
1,260	Princess Ammoniated Bone Superphosphate.....	8.00	3.00	3.00	.....	8.00	3.00	3.00	12.20	1.79	8.24	1.67	9.91	2.44	2.97	2.66	20 00	21 48
1,285	Pocahontas Special Tobacco Fertilizer.....	9.00	2.00	2.00	.....	9.00	2.00	2.00	7.60	2.56	6.20	3.01	9.21	2.01	2.45	2.16	17 00	18 72
1,301	Peter's Ammoniated Dissolved Bone.....	9.00	2.00	1.00	.....	9.00	2.00	1.00	9.00	2.43	6.40	1.68	8.13	1.53	1.86	2.70	15 50	16 41
1,319	Progressive Farmer Guano.....	8.00	2.00	3.00	.....	8.00	2.00	3.00	13.00	2.11	6.30	2.66	8.96	2.40	2.92	3.20	20 90	20 92
1,333	Pocahontas Special Tobacco Fertilizer.....	8.00	3.00	3.00	.....	8.00	3.00	3.00	6.40	1.31	6.00	3.47	8.57	1.91	2.32	2.44	18 50	17 97
1,346	Piedmont Guano for Tobacco.....	8.00	2.25	1.00	.....	8.00	2.25	1.00	10.00	4.73	1.80	1.87	9.02	2.21	2.69	2.64	16 00	17 80
1,347	Pine Island Guano.....	8.00	2.00	2.00	.....	8.00	2.00	2.00	8.20	3.26	6.95	2.39	9.34	1.91	1.11	1.66	11 00	14 33
1,348	Premium Brand Tobacco Guano.....	8.00	1.50	1.50	.....	8.00	1.50	1.50	12.20	1.60	8.10	2.01	10.11	1.31	1.59	2.28	15 00	17 16
1,353	Peter's Ammoniated Bone and Potash.....	9.00	1.50	1.25	.....	9.00	1.50	1.25	13.40	2.81	6.45	2.51	8.96	2.12	2.57	1.36	18 00	18 03
1,361	Papasco Ammoniated Corn Fertilizer.....	9.25	2.50	1.25	.....	9.25	2.50	1.25	6.00	2.94	5.05	2.18	7.23	1.63	1.69	1.16	11 00	13 46
1,408	Papasco Guano.....	9.00	1.00	1.00	.....	9.00	1.00	1.00	9.40	1.66	8.95	.52	9.47	1.63	1.98	2.79	13 00	18 20
1,469	Piedmont Pure Raw Bone Mixture.....	7.00	1.00	1.00	.....	7.00	1.00	1.00	11.00	1.92	9.05	1.12	10.17	1.41	2.93	1.82	18 00	20 78
1,487	Pollock's Special Wheat Mixture.....	9.00	2.00	2.00	.....	9.00	2.00	2.00	11.00	1.92	9.05	1.12	10.17	1.41	2.93	1.82	18 00	20 78
1,488	Pollock's Ammoniated Bone Superphosphate.....	10.00	2.00	4.00	.....	10.00	2.00	4.00	14.20	1.66	5.12	2.69	7.87	3.44	4.18	5.98	28 00	26 23
1,495	Royal Seal Compound.....	6.00	6.00	4.00	.....	6.00	6.00	4.00	12.80	1.28	6.85	1.02	7.87	1.68	4.04	2.12	15 00	16 11
1,510	Richmond Brand.....	8.00	2.00	1.00	.....	8.00	2.00	1.00	12.80	1.28	6.85	1.02	7.87	1.68	4.04	2.12	15 00	16 11

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.			GUARANTEE IN DEPARTMENT.			ANALYSIS OF CHEMIST.							Relative commercial value per ton of ingredients at seaboard.				
		Avail. Phos. Acid.		Potash.	Insol. Phos. Acid.		Ammonia.	Potash.	Water.		Insol. Phos. Acid.	Sol. Phos. Acid.	Revised Phos. Acid.	Avail. Phos. Acid.	Nitrogen.	Equity to Ammonia.	Potash.	By Guarantee.	By Analysis.
1,111	Royal Seal Compound	6.00	6.00	4.00	.....	6.00	6.00	4.00	12.80	1.85	7.25	2.75	8.00	3.99	4.85	4.32	28 00	26 87
1,121	Richmond Special	6.00	6.00	4.00	1.02	.....	6.00	6.00	10.40	1.02	7.29	2.05	9.34	3.86	4.69	5.54	28 00	28 95
1,157	Royster's No. 2 Potato Guano	8.00	1.00	1.00	.....	.....	3.00	1.00	12.00	2.82	8.80	2.14	10.94	1.11	1.35	1.30	12 00	16 34
1,181	" Best Sweet Potato Guano	3.00	4.00	4.00	.....	.....	3.00	4.00	4.20	2.56	2.50	4.35	6.85	3.64	4.42	6.80	19 00	26 91
1,184	" "	2.00	5.00	4.00	.....	.....	2.00	5.00	7.00	5.43	1.90	2.97	4.87	4.76	5.78	5.40	21 00	27 51
1,231	Reese's Pacific Guano	8.50	2.25	1.20	.....	.....	8.50	2.25	12.00	1.02	6.72	6.13	9.88	1.84	2.24	1.24	16 45	17 94
1,300	" Challenge Tobacco Grower	9.00	2.00	2.00	.....	.....	9.00	2.00	15.00	1.02	6.10	3.39	10.11	1.71	2.07	2.04	17 00	18 36
1,309	" Pacific Guano for Tobacco	8.50	2.25	1.20	.....	.....	8.50	2.25	12.00	1.02	6.72	4.49	9.59	2.33	2.83	2.66	20 00	20 74
1,338	" Challenge Tobacco Grower	9.00	2.00	2.00	.....	.....	9.00	2.00	9.40	2.11	3.85	6.19	10.04	1.88	2.29	1.62	17 00	18 53
1,408	Reeves, Catt & Co.'s Blood, Bone and Flesh	8.00	2.00	2.00	.....	.....	8.00	2.00	8.60	2.68	7.95	8.8	8.83	1.98	2.40	3.06	16 00	18 09
1,472	Ramsburg's Excelsior	9.00	2.00	1.00	9.00	2.00	10.00	1.66	5.37	6.15	3.45	9.60	2.30	2.86	96	16 00	19 14
1,472	Soluble Marine Guano	8.00	4.50	5.00	.....	.....	8.00	4.50	10.40	1.66	5.20	2.86	8.06	4.02	4.81	6.48	26 50	27 97
1,472	Special Ten Per Cent Truck Phosphate	6.00	10.00	2.00	.....	.....	6.00	10.00	12.40	26	6.40	1.40	7.50	6.25	7.58	7.30	38 00	37 02
1,472	Special Potato Guano	4.00	8.00	6.00	.....	.....	4.00	8.00	9.80	6.4	3.35	1.39	4.74	5.72	6.94	5.80	34 00	37 84
1,472	Seven Per Cent Guano	6.00	5.00	5.00	.....	.....	6.00	5.00	9.20	2.94	3.35	2.15	6.90	3.41	4.13	4.06	27 00	31 36
1,487	Special Formula Low Grade	7.00	4.00	4.00	.....	.....	7.00	4.00	7.20	6.12	4.75	3.36	7.81	2.87	3.49	4.40	23 00	23 35
1,492	Stable Manure Substitute	7.00	3.00	4.00	.....	.....	7.00	3.00	9.60	2.17	4.45	3.36	7.81	2.87	3.49	4.40	20 00	22 68
1,500	Special Truck Fertilizer	5.00	7.00	4.00	.....	.....	5.00	7.00	9.40	5.7	4.30	1.59	6.89	5.83	7.07	2.66	28 00	29 76
1,555	Standard Truck Guano	5.00	7.00	4.00	.....	.....	5.00	7.00	12.20	3.00	5.90	1.46	7.36	4.05	4.92	4.10	30 00	29 20
1,583	Stable Manure Substitute	7.00	3.00	4.00	.....	.....	7.00	3.00	8.40	2.05	5.50	2.04	7.51	2.84	3.46	4.52	30 00	28 44
1,583	Standard Seven Per Cent Ammonia Guano	7.00	7.00	5.00	.....	.....	7.00	7.00	9.60	3.07	5.55	1.08	6.53	5.30	6.44	5.44	31 99	31 99
1,583	Standard Seven Per Cent Guano for Potatoes	7.00	7.00	5.00	.....	.....	7.00	7.00	9.60	3.07	5.55	2.32	7.87	5.39	6.58	5.32	33 00	32 93
1,585	" Top Dresser for Spinach	5.00	10.00	3.00	.....	.....	5.00	10.00	12.00	2.86	4.35	1.94	6.29	8.17	9.92	5.32	33 00	32 93
1,585	Standard Ten Per Cent Guano	7.00	9.00	3.00	.....	.....	7.00	9.00	9.20	3.71	7.5	2.19	6.94	7.45	9.05	4.02	34 11	34 11
1,585	Substitute Stable Manure	7.00	3.50	4.00	.....	.....	7.00	3.50	10.00	2.02	3.30	2.72	6.02	5.63	3.07	4.00	18 50	19 23
1,585	Seaboard Popular Trucker	7.00	7.00	5.00	.....	.....	7.00	7.00	10.20	2.17	5.40	1.64	7.04	5.41	6.57	7.22	33 00	33 97
1,594	Seven Per Cent Guano	7.00	6.00	5.00	.....	.....	7.00	6.00	10.80	3.30	3.05	1.66	4.71	5.55	6.73	4.60	27 00	28 76
1,595	Soluble Marine Guano	7.00	4.50	5.00	.....	.....	7.00	4.50	10.80	2.90	3.30	1.93	7.23	4.02	4.83	4.86	25 50	26 50
1,595	Special Truck Fertilizer	7.00	5.00	2.00	.....	.....	7.00	5.00	9.84	9.0	4.10	1.85	7.05	5.05	6.00	7.29	24 00	24 71
1,594	Standard Truck Guano	7.00	5.00	4.00	.....	.....	7.00	5.00	12.20	2.17	5.48	1.92	7.80	3.52	4.27	4.60	26 00	26 71
1,599	Seaboard Popular Trucker	7.00	7.00	5.00	.....	.....	7.00	7.00	11.00	1.02	5.04	2.13	7.17	5.14	6.23	4.82	33 00	30 68
1,553	Standard Truck Guano	7.00	5.00	4.00	.....	.....	7.00	5.00	12.40	1.98	5.65	1.90	7.55	3.65	4.41	4.82	26 00	26 60

ANALYSES OF FERTILIZERS.—TABLE No. 1.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.				GUARANTEE IN DEPARTMENT.				ANALYSIS BY CHEMIST.							Relative commercial value per ton of ingredients at seaboard.	
		Ammonia.		Potash.		Insol. Phos. Acid.		Avail. Phos. Acid.		Ammonia.		Potash.		ANALYSIS BY CHEMIST.			By Guarantee.	By Analysis.
		Avail. Phos. Acid.	Potash.	Ammonia.	Potash.	Insol. Phos. Acid.	Avail. Phos. Acid.	Insol. Phos. Acid.	Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Reverted Phos. Acid.	Avail. Phos. Acid.	Nitrogen.	Equiv. to Ammonia.	Potash.		
1,224	Wooldridge's "X. C. D." Am. Bone Phos.....	8.00	10.00	10.00	4.00	.....	8.00	10.00	5.00	1.28	7.75	2.42	10.17	8.44	10.25	4.02	\$42 00	\$44 84
1,255	W. S. Farmer & Co.'s Fish Mixture.....	8.00	2.00	1.50	1.50	.....	8.00	2.00	9.80	1.08	8.20	1.47	9.67	1.87	2.28	1.86	15 50	18 37
1,287	W. S. Farmer & Co.'s Standard Phos. Guano.....	10.00	2.85	2.50	2.50	.....	10.00	2.85	8.20	1.92	7.20	2.52	9.72	2.33	2.83	2.54	21 05	20 75
1,278	Wheat and Corn Grower.....	10.00	1.50	1.50	1.50	.....	10.00	1.50	9.80	2.23	9.25	1.12	10.37	1.66	.79	1.24	16 00	13 98
1,375	Wheat and Grass Fertilizer.....	9.00	1.00	1.00	1.00	.....	9.00	1.00	8.00	2.43	6.65	2.75	9.40	1.33	1.62	1.96	13 00	16 22
1,517	Wheat and Grass Fertilizer.....	9.00	1.00	1.00	1.00	.....	9.00	1.00	11.40	1.47	7.20	3.74	10.94	1.21	1.47	1.32	13 00	16 07
1,423	"W. D." Wheat Compound.....	8.00	2.50	1.00	1.00	.....	8.00	2.50	8.80	4.52	7.00	1.26	8.25	2.44	2.97	.92	16 50	18 68
1,261	"X. X. V." Phosphate.....	8.00	2.00	1.00	1.00	.....	8.00	2.00	9.80	2.23	7.10	2.25	9.35	.90	1.10	1.96	15 00	14 61
1,326	Yellow Wreath Guano for Tobacco.....	9.00	2.50	3.00	3.00	.....	9.00	2.50	9.80	1.28	6.85	3.12	9.97	2.30	2.80	2.70	19 50	21 07
1,157	Zell's Calvert Guano.....	10.00	.75	1.50	1.50	.....	10.00	.75	12.80	1.85	10.15	1.48	11.58	.55	.69	1.74	13 75	15 20
1,159	" Special Compound for Potatoes.....	8.00	3.00	4.00	4.00	.....	8.00	3.00	13.20	1.66	9.27	.58	9.85	2.00	2.41	4.75	21 00	21 82
1,220	" Special Compound for Potatoes.....	8.00	3.00	4.00	4.00	.....	8.00	3.00	9.00	1.98	8.14	.75	8.89	2.61	3.17	3.12	21 00	21 62
1,160	" Economizer.....	9.00	1.00	1.00	1.00	.....	9.00	1.00	14.00	1.72	9.21	.52	9.73	1.00	1.22	2.04	13 00	15 43
1,458	" Economizer.....	9.00	1.00	1.00	1.00	.....	9.00	1.00	11.60	1.85	9.80	1.78	11.58	1.39	1.69	1.40	13 00	18 05
1,228	" Ammoniated Bone Superphosphate.....	8.00	2.00	1.00	1.00	.....	8.00	2.00	12.80	3.64	7.45	1.26	8.71	1.82	2.21	1.66	15 00	17 00
1,341	" Tobacco Fertilizer.....	8.00	3.00	4.00	4.00	.....	8.00	3.00	7.80	2.62	7.90	1.70	9.60	1.78	2.40	3.74	21 00	20 54

ANALYSES OF FERTILIZERS BY THE VIRGINIA DEPARTMENT OF AGRICULTURE FOR 1894.
TABLE No. 2.—NITROGENOUS SUPERPHOSPHATES.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,431	Armour's Concentrated Tankage.	Armour & Co., Chicago, Ill.	Staunton.
1,140	Baugh's Corn Fertilizer.	Baugh & Sons Co., Baltimore, Md.	Fredericksburg.
1,206	" "	" "	Bloxoms.
1,142	" " Crop Grower.	" "	Fredericksburg.
1,192	" " Double Eagle Phosphate.	" "	Onancock.
1,089	" " Raw Bone Superphosphate.	" "	Smithfield.
1,035	" " Double Eagle Phosphate.	" "	Norfolk.
1,039	" " Special Cotton Grower.	" "	Pinner's Point.
1,108	" " Double Eagle Phosphate.	" "	Suffolk.
1,144	" " Ammoniated Dissolved Animal Bone.	" "	Fredericksburg.
1,462	Baker & Co.'s Dissolved Animal Bone.	Baker & Co., Winchester, Va.	Winchester.
1,463	" " Bone.	" "	"
1,417	" " Animal Bone.	" "	Staunton.
1,418	" " "	" "	"
1,434	Baugh's Double Eagle Phosphate.	Baugh & Sons Co., Baltimore, Md.	Marshall.
1,167	Dissolved Bone.	Tygart-Allen Fertilizer Co., Philadelphia, Pa.	Keller.
1,218	Dry Ground Fish.	Williams & Clark Fertilizer Company, New York.	Only.
1,221	Dissolved Bone.	Tygart-Allen Fertilizer Co., Philadelphia, Pa.	"
1,425	" " Raw Bone.	Patapasco Guano Company, Baltimore, Md.	Staunton.
1,444	" " Bone.	Detrick Fertilizer and Chemical Company, Baltimore, Md.	Winchester.
1,462	Detrick Wheat Fertilizer.	" "	"
1,402	Horner's Dissolved Slaughter-House Bone Dust.	Joshua Horner, Jr., & Co., Baltimore, Md.	Purcellville.
1,400	Lister's Celebrated Ground Bone.	Lister's Agricultural Chemical Works, Newark, N. J.	Round Hill.
1,250	Mayfield & Brown's Fertilizer.	Mayfield & Brown, Washington, D. C.	Vienna.
1,446	Ober's Dissolved Bone.	G. Ober & Sons Co., Baltimore, Md.	Winchester.
1,183	Pure Ground Fish.	Baugh & Sons Co., Baltimore, Md.	Only.
" "	" "	Maryland Fertilizer and Manufacturing Co., Baltimore, Md.	Parkley.
1,204	Reeves, Catt & Co.'s Dissolved Raw Bone.	Reeves, Catt & Co., Staunton, Va.	Staunton.
1,401	Rasin's Dissolved Bone.	Rasin Fertilizer Company, Baltimore, Md.	Winchester.
1,456	Wheat and Corn Dressing.	Rasin & Gibbs Guano Company, Charleston, S. C.	Portsmouth.
1,464	Walker's Dissolved Bone.	Rasin Fertilizer Company, Baltimore, Md.	Roanoke.

ANALYSES OF FERTILIZERS.—TABLE No. 2.—Continued.

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ANALYSES OF FERTILIZERS BY THE VIRGINIA DEPARTMENT OF AGRICULTURE FOR 1894.
TABLE No. 3.—SUPERPHOSPHATES WITH POTASH.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,536	Alkaline Bone.....	Alexandria Fertilizer and Chemical Company, Alexandria, Va.....	Danville.
1,365	Anti-Acid Phosphates.....	Baltimore Pulverizing Company, Baltimore, Md.....	Roanoke.
1,387	Alkaline Bone.....	Alexandria Fertilizer and Chemical Company, Alexandria, Va.....	Warrenton.
1,503	".....	Maryland Fertilizer and Manufacturing Co., Baltimore, Md.....	Salem.
1,520	Allison & Addison, McGavock's Mixture.....	Allison & Addison, Richmond, Va.....	Wytheville.
1,304	".....	".....	Winchester.
1,468	Anti-Acid Phosphate.....	Baltimore Pulverizing Company, Baltimore, Md.....	Fredricksburg.
1,143	Baugh's Soluble Alkaline Superphosphate.....	Baugh & Sons Co., Baltimore, Md.....	Arlington.
1,352	Bone and Potash.....	Chesapeake Guano Company, Baltimore, Md.....	Rural Retreat.
1,354	[B. P.] Potash Mixture.....	Allison & Addison, Richmond, Va.....	Farmville.
1,289	Baltimore Soluble Phosphate.....	Patapsco Guano Company, Baltimore, Md.....	Winchester.
1,362	".....	".....	Staunton.
1,422	Baugh's Alkaline Superphosphate.....	Baugh & Sons Co., Baltimore, Md.....	Mar-hall.
1,435	Baker & Co.'s Soluble Phosphate.....	Baker & Co., Winchester, Va.....	Staunton.
1,414	".....	".....	".....
1,415	".....	".....	".....
1,469	Capital Bone and Potash Fertilizer.....	S. W. Travers & Co., Richmond, Va.....	Winchester.
1,296	".....	".....	Farmville.
1,512	Dissolved Bone with Potash.....	Davis & Whittle, Petersburg, Va.....	Troutville.
1,357	Eureka Bone and Potash.....	Atlantic and Virginia Fertilizer Company, Richmond, Va.....	Rural Retreat.
1,504	H. S. Roberts & Co.'s Super Guano.....	H. S. Roberts & Co., Westminister, Md.....	Roanoke.
1,484	Ober's Dissolved Bone Phosphate and Potash.....	G. Ober & Sons Co., Baltimore, Md.....	Woodstock.
1,429	Piedmont Dissolved Bone Phosphate Potash Mixture.....	Mr. Airy Manufacturing Company, Baltimore, Md.....	Staunton.
1,470	Reeves Catt & Co.'s Farmers' Favorite.....	Reeves, Catt & Co., Staunton.....	Winchester.
1,411	R. H. Pollock's Soluble Bone and Potash.....	R. H. Pollock, Baltimore, Md.....	Staunton.
1,478	Sickle Brand Special X Compound.....	Chesapeake Guano Company, Baltimore, Md.....	Woodstock.
1,360	Tinsley Bone and Potash Mixture.....	J. G. Tinsley & Co., Richmond, Va.....	Arlington.
1,150	".....	".....	Fredricksburg.
1,289	Victoria Bone.....	Rasin Fertilizer Company, Baltimore, Md.....	Roanoke.
1,465	Woodbridge's Bone and Potash.....	Woodbridge Fertilizer Company, Baltimore, Md.....	Warrenton.
1,384	Zell's Electric Phosphate.....	Zell Guano Company, Baltimore, Md.....	Only.
1,219	".....	".....	".....

ANALYSES OF FERTILIZERS.—TABLE No. 4.—Continued.

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ANALYSES OF FERTILIZERS.—TABLE NO. 4.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.	GUARANTEE IN DEPARTM'T.		ANALYSIS BY CHEMIST.					Relative commercial value per ton of ingredients at seaboard.		
			Insol. Phos. Acid.	Avail. Phos. Acid.	Water.	Insol. Phos. Acid.	Sol. Phos. Acid.	Reverted Phos. Acid.	Avail. Phos. Acid.	By Guarantee.	By Analysis.	
1,486	H. S. Roberts & Co.'s Dissolved S. C. Bone	13.00	.....	.....	13.00	8.60	2.05	9.65	3.18	12.83	13.00	12.83
1,509	I. X. L. Acid Phosphate	13.00	.....	.....	.....	13.00	13.60	1.45	11.90	2.87	14.77	14.77
1,519	Our Acid Phosphate or Dissolved S. C. Bone	12.00	.....	.....	.....	12.00	12.40	.97	10.70	1.01	14.71	14.71
1,364	Pure Dissolved S. C. Bone	13.00	.....	.....	.....	13.00	7.60	1.72	11.70	3.41	15.11	15.11
1,428	"	13.00	.....	.....	.....	13.00	11.00	.96	10.45	3.43	13.88	13.88
1,390	Rancoco's Plaster	1.25	.....	.....	.....	.....	9.00	2.11	2.80	.72	3.62	3.62
1,311	Reese's Dissolved S. C. Phosphate	14.00	.....	.....	.....	14.00	9.60	1.08	11.80	2.47	14.27	14.27
1,407	Reeves Catt & Co.'s S. C. Bone	14.00	.....	.....	.....	14.00	11.00	1.47	11.80	2.92	14.72	14.72
1,454	Rasin's Acid Phosphate	14.00	.....	.....	.....	14.00	12.40	.90	11.20	2.17	13.37	13.37
1,477	R. H. Pollock's Dissolved S. C. Bone	14.00	.....	.....	.....	14.00	11.20	.90	11.25	3.40	14.65	14.65
1,510	Rocket's Acid Phosphate	10.00	.....	.....	.....	10.00	13.00	3.57	9.37	1.00	10.37	10.37
1,514	Royser's High Grade Acid Phosphate	12.00	.....	.....	.....	12.00	11.80	.13	9.35	6.36	14.71	14.71
1,523	Reese's Dissolved S. C. Phosphate	13.00	.....	.....	.....	13.00	11.40	1.32	11.90	5.29	14.74	14.74
1,381	Standard Dissolved S. C. Bone	10.00	.....	.....	.....	10.00	9.60	1.60	10.65	3.21	13.86	13.86
1,355	Stonewall Brand Acid Phosphate	10.00	.....	.....	.....	10.00	13.00	1.21	10.10	2.44	12.54	12.54
1,238	"	10.00	.....	.....	.....	10.00	.....	2.56	10.30	2.96	13.25	13.25
1,262	Superior Rock Phosphate	13.00	.....	.....	.....	13.00	10.00	.38	12.35	2.58	14.93	14.93
1,307	Standard High Grade Acid Phosphate	13.00	.....	.....	.....	13.00	6.00	1.47	11.80	2.83	13.63	13.63
1,497	Standard Dissolved Bone High Grade	13.00	.....	.....	.....	13.00	12.00	1.98	10.30	3.39	13.69	13.69
1,149	Tinsley's Dissolved S. C. Bone	13.00	.....	.....	.....	13.00	11.40	.90	10.85	4.62	16.47	16.47
1,363	"	13.00	.....	.....	.....	13.00	11.20	1.15	11.45	3.21	14.66	14.66
1,302	"	13.00	.....	.....	.....	13.00	12.40	1.32	12.45	2.16	14.61	14.61
1,515	"	13.00	.....	.....	.....	13.00	11.80	2.06	10.05	2.79	12.84	12.84
1,516	"	13.00	.....	.....	.....	13.00	13.00	2.17	11.33	3.57	14.40	14.40
1,168	Zell's Dissolved Bone Phosphate	13.00	.....	.....	.....	13.00	.....	.....	.....	.....	13.00	13.00

ANALYSES OF FERTILIZERS BY THE VIRGINIA DEPARTMENT OF AGRICULTURE FOR 1894.

TABLE No. 5.—BONE MEAL.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,391	Allen's Pure Ground Raw Bone.....	Tygart-Allen Fertilizer Company, Philadelphia, Pa.....	Warrenton.
1,379	Baugh's Bone Meal.....	Baugh & Sons Company, Baltimore, Md.....	Charlottesville.
1,292	".....	".....	Farmville.
1,306	".....	".....	Lynchburg.
1,182	".....	".....	Only.
1,476	".....	".....	Woodstock.
1,419	Baker & Co.'s Raw Bone Meal.....	Baker & Co., Winchester, Va.....	Staunton.
1,420	".....	".....	Staunton.
1,396	Fine Ground Raw Bone.....	Baker & Co., Winchester, Va.....	Staunton.
1,312	Fine Ground Bone [Bob White Brand].....	Herbert Bryant, Alexandria, Va.....	Leesburg.
1,298	Farmer's Pure Bone Meal.....	Clement, Carrington & Co., Lynchburg, Va.....	Lynchburg.
1,389	Ground Animal Bone.....	W. S. Farmer & Co., Baltimore, Md.....	Farmville.
1,382	Horse Shoe Brand Fine Raw Bone.....	Alexandria Fertilizer and Chemical Company, Alexandria, Va.....	Warrenton.
1,403	Horne's Slaughter-House Bone Dust.....	Northwestern Fertilizer Company, Chicago, Ill.....	Charlottesville.
1,374	Hubbard's Pure Raw Bone.....	Joshua Horner, Jr., & Co., Baltimore, Md.....	Purcellville.
1,305	Hubbard's Pure Raw Bone.....	Hubbard & Co., Baltimore, Md.....	Bedford City.
1,395	Horse Shoe Brand Fine Raw Bone.....	Northwestern Fertilizer Company, Chicago, Ill.....	Lynchburg.
1,452	Horne's Slaughter-House Bone Dust.....	Joshua Horner, Jr., & Co., Baltimore, Md.....	Fredricksburg.
1,192	Miller's Pure Raw Bone Meal.....	W. H. Miller & Son, Lynchburg, Va.....	Lynchburg.
1,378	Pure Ground Raw Bone.....	Durham Fertilizer Company, Durham, N. C.....	Charlottesville.
1,393	".....	Patasco Guano Company, Baltimore, Md.....	Leesburg.
1,426	".....	Alexandria Fertilizer and Chemical Company, Alexandria, Va.....	Staunton.
1,473	".....	Ramsburg Fertilizer Company, Fredericks, Md.....	Woodstock.
1,437	Pure Raw Bone Meal.....	Alexandria Fertilizer and Chemical Company, Alexandria, Va.....	The Plains.
1,445	Pure Fine Ground Bone.....	Detrick Fertilizer and Chemical Company, Baltimore, Md.....	Winchester.
1,460	Pure Raw Bone Meal.....	G. H. Wakeman, Waterlick, Va.....	Waterlick.
1,313	".....	Clement, Carrington & Co., Lynchburg, Va.....	Lynchburg.
1,390	Star Pure Ground Bone.....	Tygart-Allen Fertilizer Company, Philadelphia, Pa.....	Mt. Holly.
1,254	Scott's Ground Raw Bone.....	Scott Fertilizer Company, Elkton, Md.....	Fredricksburg.
1,163	".....	Swift & Co., Chicago, Ill.....	Staunton.
1,409	Swift's Raw Bone Meal.....	".....	".....

ANALYSES OF FERTILIZERS.—TABLE No. 5.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.		GUARANTEE IN DEPTM'T.		ANALYSIS BY CHEMIST.			
		Phos. Acid.	Ammonia.	Phos. Acid.	Ammonia.	Water.	Phos. Acid.	Nitrogen.	Equiv. to Ammonia.
1391	Allen's Pure Ground Raw Bone.....	20.00	4.50	20.00	4.50	4.80	19.45	3.08	3.74
1379	Bough's Bone Meal.....	21.00	4.00	21.00	4.00	5.20	22.26	5.00	6.07
1282	" " " ".....	21.50	4.00	21.50	4.00	5.20	21.08	5.00	4.93
1366	" " " ".....	21.50	4.00	21.50	4.00	5.00	22.54	4.11	5.90
1382	" " " ".....	21.50	4.00	21.50	4.00	5.00	22.06	4.34	5.15
1476	" " " ".....	21.50	4.00	21.50	4.00	5.00	21.55	4.68	5.90
1419	Baker & Co.'s Raw Bone Meal.....	21.50	4.00	21.50	4.00	6.60	22.71	3.62	4.76
1420	" " " ".....	21.50	4.00	21.50	4.00	7.00	21.52	4.33	5.26
1396	Fine Ground Raw Bone.....	20.00	4.00	20.00	4.00	4.80	20.66	4.32	5.29
1312	Fine Ground Bone [No. White Brand].....	20.00	4.50	20.00	4.50	4.80	18.35	3.77	3.97
1288	Farmer's Pure Bone Meal.....	20.00	4.00	20.00	4.00	5.00	22.47	3.60	4.62
1389	Ground Animal Bone.....	20.00	4.00	20.00	4.00	5.20	24.01	3.91	4.02
1382	Horseshoe Brand Fine Raw Bone.....	22.00	4.00	22.00	4.00	5.00	23.85	5.12	6.01
1403	Hornet's Slougher-House Bone Dust.....	20.00	0.00	20.00	6.00	7.00	20.85	5.26	6.39
1374	Hunbard's Pure Raw Bone.....	20.00	4.00	20.00	4.00	4.80	24.89	4.40	6.09
1365	Horseshoe Brand Fine Raw Bone.....	22.00	4.00	22.00	4.00	4.40	22.52	4.10	5.35
1166	Hornet's Slaughter-House Bone Dust.....	20.00	6.00	20.00	6.00	3.00	12.42	6.04	7.33
1482	Miller's Pure Raw Bone Meal.....	22.00	4.00	22.00	4.00	4.80	20.72	5.06	6.14
1378	Pure Ground Raw Bone.....	4.00	4.00	.....	4.00	5.60	20.88	3.69	4.48
1383	" " " ".....	4.00	4.00	.....	4.00	6.80	20.40	3.67	4.67
1428	" " " ".....	22.00	4.00	22.00	4.00	6.40	20.40	3.67	4.67
1473	" " " ".....	22.00	4.00	22.00	4.00	6.80	20.74	3.72	4.80
1457	Pure Raw Bone Meal.....	.....	4.00	26.00	3.00	7.80	22.00	4.32	5.26
1446	Pure Fine Ground Bone.....	22.00	4.50	22.00	4.50	7.00	21.86	4.51	5.07
1490	Pure Raw Bone.....	17.91	5.61	17.91	5.61	5.20	21.91	4.62	5.61
1313	" " " ".....	20.00	4.00	20.00	4.00	5.60	20.60	3.71	4.61
1264	Star Pure Ground Bone.....	21.00	4.80	21.00	4.80	6.40	22.07	2.73	3.38
1153	Scott's Ground Raw Bone.....	22.00	4.00	22.00	4.00	6.80	21.82	3.84	4.67
1409	Swift's Raw Bone Meal.....	23.00	4.00	23.00	4.50	5.60	24.62	4.33	5.26

ANALYSES OF FERTILIZERS BY THE VIRGINIA DEPARTMENT OF AGRICULTURE FOR 1894.
TABLE No. 6.—MISCELLANEOUS.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,240	Natural Plant Food.....	James River Marl and Bone Phosphate Co., Richmond, Va.....	Wakefield, Va.
1,245	" ".....	" ".....	Waverly, Va.
1,118	" ".....	" ".....	Norfolk, Va.
1,202	Ostrich Guano.....	Baugh & Sons Co., Baltimore, Md.....	Parkley, Va.
1,216	Orchilla Guano.....	Wooldridge Fertilizer Company, Baltimore, Md.....	Temperanceville.
1,438	" ".....	" ".....	Rectortown.

ANALYSES OF FERTILIZERS.—TABLE No. 6.—Continued.

Department No.	NAME OF BRAND.	GUARANTEE IN DEPTM'T.		ANALYSIS BY CHEMIST.			Relative commercial value per ton of ingredients at seaboard by Guarantee.
		Insol. Phos. Acid.	Potash.	Water.	Insol. Phos. Acid.	Potash.	
1,940	Natural Plant Food.....	2.61	2.17	.....	Trace.	Trace.	\$4 78
1,945	".....	2.61	2.17	.....	Trace.	Trace.	4 78
1,118	".....	2.61	2.17	6.40	Trace.	Trace.	4 78
1,902	Ostrich Guano.....	21.00	.....	4.80	Trace.	Trace.	
1,916	Orchillo Guano.....	14.00	.....	3.60	14.97	14.97	
1,488	".....	14.00	.....	5.80	16.12	16.12	

ANALYSES OF FERTILIZERS BY THE VIRGINIA DEPARTMENT OF AGRICULTURE FOR 1894.
TABLE No 7.—POTASH SALTS.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLED AT.
1,168	Genuine German Kainit.....	Tygart-Allen Fertilizer Company, Philadelphia, Pa.....	Keller.
1,416	Kainit.....	Baker & Co., Winchester, Va.....	Staunton.
1,427	Old Reliable Brand German Kainit.....	James Bonday & Co., Baltimore, Md.....	Staunton.

ANALYSES OF FERTILIZERS.—TABLE No. 7.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS ON PACKAGE.	GUARANTEE IN DEPARTMENT.	ANALYSIS BY CHEMIST.		Relative commercial value per ton of ingredients at seaboard.	
				Water.	Potash.	By Guarantee.	By Analysis.
1,168	Genuine German Kainit.....	.....	K ₂ SO ₄ 22.00	3.60	14.06	\$11 00	\$14 06
1,416	Kainit.....	.....	12.00	1.60	12.58	12 00	12 58
1,427	Old Reliable Brand German Kainit.....	.....	12.00	1.40	13.02	12 00	13 02

ANALYSES OF FERTILIZERS BY THE VIRGINIA DEPARTMENT OF AGRICULTURE FOR 1894.

TABLE No. 8.—FARMERS' SAMPLES.

Department No.	NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLE SENT BY.
1	Acid Phosphate.....	Reeves Catt & Co., Staunton, Va.	C. E. Clevenger.
2	".....	".....	F. A. Pultz.
3	".....	".....	Orris A. Browne.
4	Bone Meal.....	Reeves Catt & Co., Staunton, Va.	F. C. Berberich.
5	Sample of Blood.....	W. A. Miller, Lynchburg, Va.	Fishersville F'm's' Ch.
6	Bone Meal.....	Reeves Catt & Co., Staunton,	W. A. Miller.
7	".....	".....	Fishersville F'm's' Ch.
8	".....	Baugh & Sons Co., Baltimore, Md.	W. Gordon Merrick.
9	Baugh's Seven Per Cent Potato Guano.....	Zell Guano Co., Baltimore, Md.	C. E. Clevenger.
10	Chaney & Vaden's Special Tobacco Fertilizer.....	Reeves Catt & Co., Staunton,	T. B. Wright.
11	Dissolved Animal Bone.....	Atlanta Guano Co., Atlanta, Ga.	W. P. Anderson.
12	Edgystone Soluble Guano.....	Hubbard & Co., Baltimore, Md.	D. B. Sites.
13	Fertilizer.....	".....	R. G. Farmer.
14	Farmer's I. X. L. Phosphate.....	".....	Orris A. Browne.
15	Fertilizer.....	W. S. Wilkins, Portsmouth, Va.	Jones, Purvis & Wilson.
16	".....	Reeves Catt & Co., Staunton, Va.	Orris A. Browne.
17	".....	M. P. Hubbard & Co., Baltimore, Md.	The Commissioner.
18	".....	".....	"
19	".....	".....	"
20	".....	".....	"
21	".....	".....	"
22	Farmers' Favorite.....	W. S. Wilkins, Portsmouth, Va.	W. S. Wilkins.
23	".....	Reeves Catt & Co., Staunton, Va.	Wm. N. Wilson.
24	".....	M. P. Hubbard & Co., Baltimore, Md.	P. Ellakoo.
25	Fish.....	A. T. Booz & Son.....	Orris A. Browne.
26	Home-Made Fertilizer.....	".....	Commissioner.
27	Hubbard's Special Ten Per Cent.....	Hubbard & Co., Baltimore, Md.	"
28	".....	M. P. Hubbard & Co., Baltimore, Md.	Jones, Purvis & Wilson.
29	".....	".....	Geo. S. Neims.
30	".....	".....	J. I. Nurney.

ANALYSES OF FERTILIZERS.—TABLE No. 8.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS BY CHEMIST.						Relative commercial value per ton of ingredients at seaboard by analysis.
		Water.	Insol. Phos. Acid.	Avail. Phos. Acid.	Nitrogen.	Equiv. to Ammonia.	Potash.	
1	Acid Phosphate.....	1.85	14.21					\$14 21
2	".....	3.64	13.63					13 63
3	".....	2.17	14 20					14 20
4	Bone Meal.....							
5	Sample of Blood.....			.38	14.64	17.77		
6	Bone Meal.....	22.52			2.92	3.55		53 69
7	".....	24.69			4.61	5.60		
8	".....	23.79			4.43	5.38		
9	".....	21.62			3.72	4.52		
10	Baugh's Seven Per Cent Potato Guano.....	7.90			5.78	7.02		
11	Chaney & Vaden's Special Tobacco Fertilizer.....	2.17	6.78	5.16	6.26		5.32	33 88
12	Dissolved Animal Bone.....	2.23	10.11	2.10	2.55		2.78	20 54
13	Eddystone Soluble Guano.....	6.18	7.95	2.41	2.93		1.00	16 74
14	Fertilizer.....	1.28	9.91	1.70	2.06		.50	16 59
15	Farmers' I. X. L. Phosphate.....	5.05	4.93				6.77	6.31
16	Fertilizer.....	2.05	7.87					
17	".....	2.23	7.17		1.91	2.20		15 80
18	".....	.56	4.94	4.53	5.88	3.70		28 41
19	".....			7.55	5.50			21 44
20	".....	2.68	3.46	7.62	9.25	3.86		39 25
21	".....	4.67	6.33	1.98	2.40	3.20		35 11
22	".....	3.90	5.18	2.03	2.47	2.94		16 73
23	Farmers' Favorite.....	3.26	2.56	2.87	3.49	1.04		15 53
24	" Acme.....	1.66	8.90	.25	.31	1.90		14 07
25	Fish.....	.97	10.26				1.45	11 73
26	Home-Made Fertilizer.....	33.60	2.43	2.69	4.88	5.93	1.70	16 31
27	".....	9.34	.38		.63	.76	.34	
28	Hubbard's Special Ten Per Cent.....	29.87	Trace		.28	.34	.35	40 72
29	" Bermuda Guano.....	.90	7.93		8.87	6.18		30 86
30	".....	1.98	11.07		4.46	7.25		33 63
		2.05	8.44					

ANALYSES OF FERTILIZERS.—TABLE No. 8.—Continued.

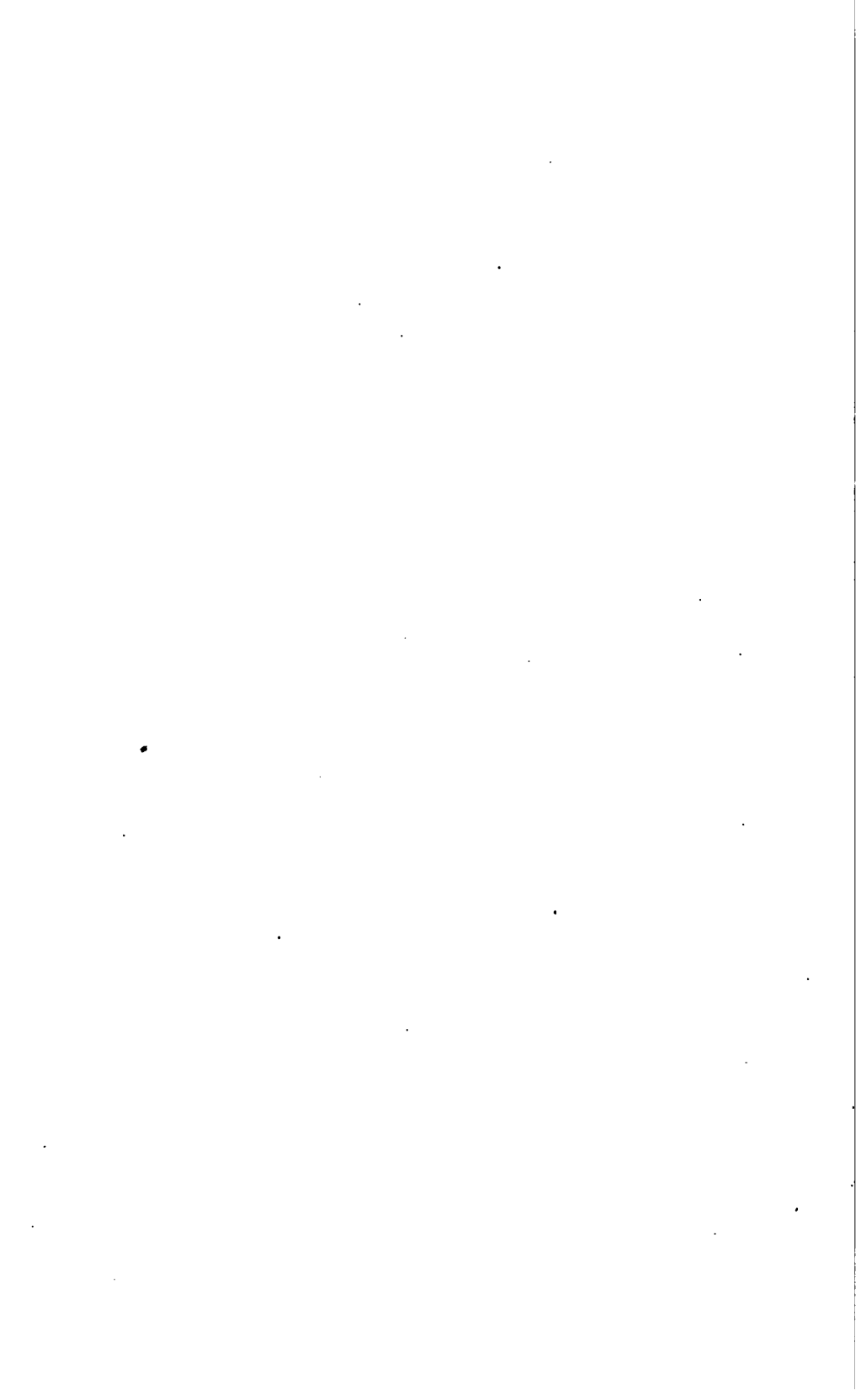
NAME OF BRAND.	ADDRESS OF MANUFACTURER OR GENERAL AGENT.	SAMPLE SENT BY
31 Natural Plant Food.....	Soft Phosphate Mining Co.....	J. W. East.
32 Nitre Waste.....	S. L. Webster & Sons, Cambridge, Md.....	Orris A. Browne.
33 Our Special Six Per Cent Guano.....	G. Ober & Sons Co., Baltimore, Md.....	G. K. Nelms.
34 Pure Dissolved Animal Bone.....	".....	L. S. Cecil.
35 " Raw Bone.....	Northwestern Fertilizer Co., Chicago, Ill.....	"
36 Potash Salt.....	Richmond Guano Co., Richmond, Va.....	G. F. Jackson.
37 Premium Brand Fertilizer.....	Hubbard & Co., Baltimore, Md.....	J. S. Payne.
38 Royal Seal Compound.....	Resin Fertilizer Co., Baltimore, Md.....	Jones, Purvis & Wilson.
39 Resin's Dissolved Bone.....	Hubbard & Co., Baltimore, Md.....	L. S. Cecil.
40 Royal Seal Compound.....	Standard Guano Co., Norfolk, Va.....	J. D. Wright.
41 Royal Seal Compound.....	".....	Thomas Jones.
42 Seven Per Cent. Guano.....	Magrath & Chesley, Fredericksburg, Va.....	H. W. Edwards.
43 Special Corn and Vegetable Fertilizer.....	Reeves Catt & Co., Staunton, Va.....	Wm. N. Wilson.
44 ".....	".....	W. A. Freed.
45 S. C. Bone.....	James G. Tinsley & Co., Richmond, Va.....	Jas. A. Brander.
46 ".....	Standard Guano Co., Norfolk, Va.....	G. W. Smith.
47 Stonewall Tobacco Fertilizer.....	Reeves Catt & Co., Staunton, Va.....	Thomas Jones.
48 Ten Bark Ashes.....	S. L. Webster & Sons, Cambridge, Md.....	Fisherville Club.
49 Ten Per Cent Guano.....	".....	G. K. Nelms.
50 Tankage.....	".....	"
51 Webster's Special Six Per Cent Guano.....	".....	"

Department No.

ANALYSES OF FERTILIZERS.—TABLE No. 8.—Continued.

Department No.	NAME OF BRAND.	ANALYSIS BY CHEMIST.						Relative commercial value per ton of ingredients at seaboard by analysis.
		Water.	Insol. Phos. Acid.	Avail. Phos. Acid.	Nitrogen.	Equiv. to Ammonia.	Potash.	
31	Natural Plant Food.....		15.67	2.70	Trace		22.42	\$25 47
32	Nitre Waste.....		.51	4.74	4.40	5.33	4.74	
33	Our Special Six Per Cent Guano.....		1.06	12.03	2.41	2.93		
34	Pure Dissolved Animal Bone.....		21.31		4.01	4.87		
35	" Raw Bone.....		24.12		4.12	5.01		
36	".....						14.44	
37	Potash Salt.....		1.54	9.27		2.79	2.98	
38	Premium Brand Fertilizer.....		1.66	9.09		4.45	6.18	
39	Royal Seal Compound.....		3.90	9.35		2.35	2.86	
40	Royal Seal Compound.....		1.41	8.31	4.25	5.16	3.70	
41	Royal Seal Compound.....		2.68	5.00	5.67	6.88	5.16	
42	Seven Per Cent Guano.....		2.68	5.00	5.67	6.88	5.18	
43	".....		3.77	8.71		2.41	1.20	
44	Special Corn and Vegetable Fertilizer.....			14.33			14.33	
45	S. C. Bone		1.47	14.67			14.67	
46	".....		1.00	8.50	2.14	2.80	2.14	
47	Stonewall Tobacco Fertilizer.....		1.28					
48	Tan Bark Ashes.....		2.56	3.13	7.45	9.03	1.82	
49	Ten Per Cent Guano.....		7.42	3.07	7.69	9.34	1.82	
50	Tankage.....		.56	4.56	4.53	5.50	6.52	
51	Webster's Special Six Per Cent Guano.....							

REPORT OF THE INSPECTOR.



REPORT OF INSPECTOR.

Hon. THOMAS WHITEHEAD,
Commissioner of Agriculture:

SIR :

I beg leave to submit a report of the work done in this branch of the Department for the year ending Sept. 30th, 1894.

Early in February the farmers and truckers around Norfolk began preparation for their spring crops, and there was a brisk sale of high grade truck fertilizers throughout the entire trucking section during the months of February, March and April.

An inspector having been placed in Norfolk, with an office at 185 Main street, the Department was well up with the trade during the entire season.

An inspector was sent through the Northern Neck and the counties of the western shore of the Chesapeake bay. This section had long been a field of operation for Maryland manufacturers who would not comply with the law. The trip was very successful, resulting in the detection of twelve manufacturers selling goods which were not registered.

The inspectors were put into the tobacco counties about the first of May, and having finished this section, we closed the spring season the 12th day of June, having taken 412 samples. This is the best record yet made by the Department. It shows an increase of 73 samples over the spring season of 1893, and the work being finished eighteen days earlier than in that year.

The fall tour of inspection began the 20th day of August and ended the 30th of September. In this season we drew 191 samples. This is an increase of six samples over the fall season of 1893.

The sale of fertilizers continues to increase. I place the sales this year at 156,582 tons. While the figures are not absolutely correct as to pounds, still they are the most reliable that were obtainable, and are substantially correct, showing an increase of 4,500 tons over the sales of 1893, when the total sales amounted to 152,082 tons. Placing this at an average of \$25 per ton, we find \$3,914,550 expended by farmers of this State for fertilizers this year.

There are 109 manufacturers registered and doing business in this State, forty-eight of these are Virginia firms. Thirty-five of the Virginia manufacturers have well fitted up factories for the manufacture and manipulation of fertilizers. The remaining thirteen have their goods made for them. There are registered in the Department for the year 1894, 1196 brands of fertilizer, a majority of these brands were registered before the law allowing only ten brands for one registration fee

went into effect. The inspection of the fertilizer factories located in Virginia show the manufacturers to use only such materials as are beneficial to the soil and available as plant food.

The Atlantic & Virginia Fertilizer Company, S. W. Travers & Co., Allison & Addison & Co., and Jas. G. Tinsley & Co.. have large acid chambers connected with their works. They manufacture from 25,000 to 30,000 tons of sulphuric acid annually, which is derived largely from Virginia pyrites.

In the spring season we found 49 manufacturers with goods on the market not registered at the time of sampling. In the fall season we found three.

Forty brands were found on the market with a different guaranteed analysis printed on the bag from that registered in the Department. These goods were seized under sec. 10 of the act approved March 8th, 1894, and were only released when the manufacturers had complied with our rules and regulations.

I am glad to be able to report fewer disputes between manufacturers and farmers this year than in 1893.

It is also gratifying to report that on the whole the fertilizers found on the market this year showed a higher analysis as compared with the manufacturers guarantee than in 1893. This would indicate that the manufacturers are exercising more care in the manipulation of their goods than they did in the past.

Ten bulletins have been issued containing the analyses of 452 brands. The analyses not published in the bulletins will appear in the chemist's report.

I have also to report thirty-seven samples received, drawn according to section 6 of the act approved March 8, 1894.

In the spring season Messrs. T. J. Stratton and John C. Cartwright were employed to assist in the inspection. These gentlemen performed their duties faithfully. Mr. Stratton was also employed in the fall season.

Below will be found a table giving the number of samples taken, brands registered, irregularities, violations, &c. I also file herewith a report of the inspection of fertilizer factories located in this State; also a list of the manufacturers with goods duly registered in this department:

Number of samples taken by inspectors from February 1st to June 12th...	412
Number of samples taken by inspectors from August 20th to September 30th	191
Total for year 1894.....	603
Number of manufacturers found with goods on the market not registered at the time of sampling.....	52
Number of brands bearing irregular and misleading brandings.....	40
Number of brands ten per cent below the manufacturers guarantee whose further sale has been prohibited in the State.....	4
Number of brands registered in the department for the year 1894.....	1,196

Respectfully submitted,

I. P. WHITEHEAD,
Inspector.

INSPECTION OF FACTORIES.

THE ALLIANCE AND INDUSTRIAL UNION MANUFACTURING COMPANY have their factory located at Ellerson's, Va. They make their goods from the following materials : Tankage, blood, bone, nitrate soda, sulphate ammonia and acid phosphate.

They have the following brands registered in the department :

Alliance Ten Per Cent.

Truckers' Guano.

Alliance Tobacco Guano.

Sweet Potato Guano.

Acid Phosphate.

Corn Guano.

Bone and Potash (or Potash Compound).

Equity Guano.

Alliance Wheat Guano.

Electric Guano.

McMENAMIN & Co., of Hampton, Va., have one brand registered, "Crab Scraps." The goods are made from the scraps of crabs.

MOOMAU & CRUMPACKER, of Bonsacks, Va., have factory at that place. Their goods are made of bone, kainit, S. C. phosphate, and Novia Scotia plaster.

They have two brands registered :

Special Vegetable Fertilizer.

Pure Raw Bone Meal.

ALLISON & ADDISON have their factory located in Chesterfield opposite Richmond. These are very extensive works, fitted up with all necessary machinery for the manufacture of fertilizers. They also have large acid chambers connected with their works.

They use in manufacture of their goods : Bone, S. C. phosphate, tankage, dried blood, dried fish scrap, azotine, nitrate of soda, sulphate of ammonia, sulphuric acid and kainit.

They have the following brands registered :

Anchor Brand Fertilizer.

A. A. Ammoniated Bone Phosphate.

Mooer's Mixture.

McGavock's Special Mixture.

B. P. Ammoniated.

Anchor Brand Tobacco Fertilizer.

B. P. (Potash Mixture).

Acid Phosphate.

Star Brand Vegetable Guano.

Star Brand Tobacco Manure.

Star Brand Guano.

THE ALEXANDRIA FERTILIZER CHEMICAL COMPANY have their works in Alexandria, Va. The buildings are 66x300 feet. Outside storage capacity for 12,000 tons. The factory is fitted up with machinery for turning out 100 tons per day. They

use in their goods dried blood, azotine, tankage, S. C. bone, animal bone, dissolved animal bone, kainit, muriate potash. They have the following brands registered :

Ground Animal Bone and Potash.

Ground Animal Bone.

Alkaline Bone.

Acid Phosphate.

Lodge's Formula.

Princess.

Ammoniated Dissolved Bone.

Excelsior.

Grain and Grass Mixture.

Potato Fertilizer.

Corn and Oats Fertilizer.

Our Raw Bone Phosphate.

Ammoniated Dissolved Bone.

Dissolved S. C. Bone.

Dissolved S. C. Bone.

Triplett's Ammoniated Bone.

Bell Haven, No. 1.

Bell Haven, No. 2.

Alkaline Bone.

Ammoniated Dissolved Bone.

Dissolved S. C. Bone.

Farmers' Formula, No. 1.

Farmers' Formula, No. 2.

AMERICAN FISH GUANO COMPANY have their factory located at Harborton, Va. They have two main buildings—one 40x80 feet, with an addition 20x30 feet, all two-story, and one 36x80 feet, three stories high; and they have three one-story storage buildings, aggregating 108x350 feet. They have the following brands registered in the department, viz. :

Virginius Guano.

Ocean Guano.

Sound Ammoniated Superphosphate.

Sweet Potato Mixture.

Special Sweet Potato Fertilizer.

They work on an average of one hundred hands per day during the season. The factory has a capacity of one hundred tons per day, in the manufacture of which they use kainit, muriate of potash, fish, sulphate of ammonia, and bone phosphate.

THE AMERICAN FERTILIZING COMPANY have their factory in South Portsmouth, with office in Norfolk, Va. The main building is 100x185 feet, two stories with a three-story tower, 40x40 feet. Capacity of the works, 130 tons per day—40,000 tons annually.

They work during the season fifty hands per day. They register the following brands, viz. :

Ten Per Cent Ammonia Fertilizer.

Seven Per Cent Ammonia Fertilizer.

Special Irish Potato.

Substitute for Stable Manure.

High Grade Special Formula.

High Grade Top Dresser.

Low Grade Special Formula.

Peruvian Mixture.

Excelsior Peanut.

Kainit.

Acid Phosphate.

They use in the manufacture of these goods the following materials, viz. : Sulphate of ammonia, nitrate of soda, dried blood, azotine, tankage, dried fish scrap, dissolved bone, raw bone, dissolved bone black, sulphate of potash, muriate of potash, and kainit.

THE ATLANTIC AND VIRGINIA FERTILIZER COMPANY have factories in Baltimore and Richmond. The works in Richmond consist of a brick and iron fertilizer factory, 300 feet by 60 feet, three stories high, with large wings and a large additional storage house. Their acid-plant building is an iron building 300 by 80 feet. The acid chambers are situated sixteen feet above the ground, and give large additional storage room under them. The factory is fitted up with the latest and most improved machinery for making acids and fertilizers. They have an annual capacity of about 15,000 tons of acid and about 10,000 tons of fertilizer. They employ about sixty-five hands. Their acid is made from Virginia pyrites from their mines in Louisa county, Va. They are the pioneers in acid-making from pyrites in the United States. They use in the manufacture of their goods the following materials: Charleston and Florida phosphate, bone and bone black, German potash salts, tankage, blood, fish scrap, sulphate of ammonia, and nitrate of soda.

They have the following brands registered in the department :

Eureka B. and P.

Eureka Acid Phosphate.

Our Acid Phosphate.

Crenshaw's Acid Phosphate.

Richmond Special.

Orient Complete Manure for Tobacco.

Orient Complete Manure.

Eureka Ammoniated for Tobacco.

Eureka Ammoniated.

Virginia Truckers.

S. C. High Grade Phosphate.

BAKER & Co., of Winchester. Va., have the following brands registered in this department :

Baker & Co.'s Pure Bone Meal.

" Dissolved Animal Bone.

" Dissolved Bone.

" Ammoniated Superphosphate.

" Soluble Phosphate.

" Soluble Phosphate.

" S. C. Bone.

BLACKSTONE GUANO COMPANY have their factory located at Blackstone, Va. They use the following materials in the manufacture of their goods: Bone, S. C. phosphate, kainit, tankage, nitrate soda, &c.

They have the following brands registered:

Hard Cash.

Bellefonte.

Alliance.

HERBERT BRYANT has his factory located in Alexandria, Va., with a storage capacity of 55,600 tons, and is fitted up with all necessary machinery for mixing 100 tons per day. He works from fifteen to thirty hands during the season. He uses the following materials in the manufacture of his goods: Raw animal bone, bone black, S. C. phosphate, tankage, blood, azotine, muriate and sulphate of potash.

He has the following brands registered:

Bryant's S. C. Bone.

Bryant's Fine Ground Raw Bone.

Raw Bone Compound.

Belle Haven Dissolved Phosphate.

Bryant's Corn Special.

Bryant's Corn and Oats Fertilizer.

Bryant's Formula "E."

Bryant's Ammoniated Dissolved Bone.

JOHN W. BUNTING & SONS have their factory located at Chincoteague. They use fish as the principal ingredient in the manufacture of their goods. They also use S. C. phosphate and kainit.

They have the following brands registered:

"Accomac Fish Phosphate."

Accidulated Fish Phosphate.

CLEMENT, CARRINGTON & Co., of Lynchburg, have their goods made by a Baltimore firm.

They have the following brands registered:

Standard Dissolved S. C. Bone.

"A. A." Complete Wheat Guano.

C. C. & Co.'s Pocahontas Special Tobacco Guano.

"Standard Tobacco Manure.

Yellow Leaf Guano.

Nitro-Ammoniated Bone and Potash.

C. C. & Co.'s Special Truck Guano.

"Old Chief Tobacco Guano.

Old Indian Standard Guano.

Bob White Brand Fine Raw Bone Meal.

Pure Dissolved Bone.

C. C. & Co.'s Pure Ground Raw Bone.

Pure Dissolved Bone.

Union Brand Standard Tobacco Guano.

Skull Brand Ammoniated Guano.

Lobos Peruvian Guano.

C. C. & Co.'s Old Chief Brand for Tobacco.

" Blood, Bone and Potash.

" Imperial Dissolved Bone Phosphate.

" Butcher's Pure Animal Bone.

REEVES, CATT & Co., of Staunton, have the following brands made for them, which are registered in the Department :

Pure Raw Bone.

Fine Ground Animal Bone.

Dissolved Raw Bone.

Blood, Bone and Flesh.

Farmer's Favorite.

Farmer's Phosphate.

Dissolved S. C. Bone.

COCKRELL & REED, of Reedsville, Va., have factory located at that place. They have one brand registered in the department :

"The Alliance Favorite."

E. B. FREEMAN & Co., of Norfolk, have their goods registered in Virginia. Their factory is located in Maryland.

The following brands are registered :

Pocomoke Superphosphate.

Freeman's Early Truck Grower.

" Irish Potato Grower.

Standard Truck Guano.

J. E. GRAHAM has factory in Staunton, Va.

He has the following brands registered :

Graham's Star Phosphate.

Staunton Wheat Fertilizer.

Augusta Wheat Fertilizer.

S. C. Bone.

Graham's Ground Bone.

HENRICO SANITARY COMPANY, of Manchester, Va., have one brand registered :

"Natural."

JOHN R. HILL, of South Boston, has his goods made for him. He has the following brands registered in the department :

Hill's Bright Tobacco Guano.

" " " " No. 2.

" Alliance High Grade.

" Corn Grower.

HINTON & TOULSON, of Mila, Va., have the following brands registered :

Corn Producer.

Ceres.

These goods are made mostly from fish.

THE IMPERIAL GUANO COMPANY have their offices, storage buildings, and wharves in Norfolk, Va., and their factory at Money Point, Va. Their buildings are four in number and cover about three-quarters of an acre. The factory is fully equipped with all necessary machinery, and has a capacity of 100 tons per day of ten hours. They use the following materials in the manufacture of their goods: Tankage, azotine, fish scrap, bone, bone black, night soil, high grade soluble phosphate, sulphate ammonia, nitrate soda, muriate potash, sulphate of potash, and kainit.

They have the following brands registered, viz.:

Imperial Ten Per Cent Guano.

" Guano for Potatoes.

" Top Dresser for Spinach.

" Seven Per Cent for Potatoes.

" Special Seven Per Cent for Potatoes and Early Truck.

" Fish and Bone.

" Guano for Peanuts and Corn.

" " for Strawberries.

" " for Sweet Potatoes and Corn.

" Cotton Grower.

" German Kainit.

High Grade Acid Phosphate.

Imperial Potato Grower.

" Guano for Tobacco.

They work on an average from thirty-five to fifty hands.

JAMES RIVER MARL AND BONE PHOSPHATE COMPANY have factory located near City Point. They prepare and dry marl.

They have one brand registered, "Natural."

MAGRATH & CHESLEY, of Fredericksburg, have two brands manufactured for them, which are registered.

Pure Raw Bone Meal.

Special Corn and Vegetable Fertilizer.

W. H. MAY & SON, Alexandria. Size of building 54x85, three stories high. They work on an average about five hands. They use the following materials in the manufacture of their goods: Fish, bone, muriate potash, kainit, acid phosphate, tankage and blood. They have the following brands registered:

Acid Phosphate.

May's Fish Mixture.

Ammoniated Bone Phosphate.

May's Potato Fertilizer.

Raw Bone.

THE OLD DOMINION GUANO COMPANY have their factory and wharves in Atlantic City, with office in Norfolk, Va. The building is 60x400 feet, two stories high, with a tower 20x20 feet three stories high. The factory is supplied with the best machinery, and has a capacity of two hundred tons per day of ten hours. They work on an average sixty-five hands.

They register the following brands, viz :

Farmers' Union Guano.

Blood, Bone and Potash.

Old Virginia Tobacco Guano.

Farmers' Soluble Bone Tobacco Guano.

Old Dominion Soluble Tobacco Guano.

Old Dominion Special Wheat Guano.

Old Dominion High Grade Bone Phosphate for Wheat.

High Grade Alkaline Bone.

Kainit.

They use in the manufacture of their goods the following materials: Tankage, blood, bone, kainit, silvernite, manure salts, sulphate ammonia, muriate potash, nitrate soda, acid phosphate, fish scrap and sulphate potash.

CHARLES REID & SONS have their factory at Money Point and their office in Norfolk, Va. Their buildings cover one-half acre of ground. Their factory is fitted up with machinery and can turn out forty tons per day. They work from eight to nine hands the year round.

They register the following brands :

Farmers' Challenge, 10 per cent.

Farmers' Challenge, 7 per cent.

Farmers' Favorite Guano.

Stable Manure Substitute Guano.

Strawberry Guano.

Pure Raw Bone Dust.

They use fish scrap, blood, acid phosphate, tankage, dissolved bone, muriate potash, nitrate of soda, soil ammonia.

RICHMOND GUANO COMPANY have the following brands registered in Virginia :

Premium Brand for Tobacco.

Dixie Brand.

Bone Mixture.

Premium Dissolved Bone.

Dixie Dissolved Bone.

Alkaline Bone.

Raw Bone.

Alliance Bone Mixture.

Alliance Dissolved Bone Phosphate.

Co-operative Phosphate.

Our Mixture.

Bone Meal.

THE STANDARD GUANO COMPANY have their factory in Norfolk, Va. They have a building 404x120 feet, two stories high. They have machinery for manipulating their goods. The factory has a capacity of twenty tons per day of ten hours. They work during the season five hands on an average. They use in their goods: Nitrate soda, sulphate of ammonia, tankage, blood, dry fish, acid fish, refuse from slaughter houses, and dead animals from the city, kainit, and muriate potash, azotine, acid phosphate, sulphate of potash. They have the following brands registered :

Standard Ten Per Cent Guano.

Substitute Stable Manure.

Seven Per Cent.

Raw Bone.

THE STANDARD SOFT PHOSPHATE COMPANY, of Alexandria, Va., have their goods registered in this State. They have no factory. Their goods are a natural product. They have the following brands :

Standard Soft Phosphate.

Natural Plant Food.

S. W. TRAVERS & Co. have their factory located on the James river below Richmond. The building is 140x350 feet, with acid chambers 340x60 feet. They work from 20 to 75 hands the year round. Goods are made from the following materials : Dissolved S. C. bone, hog tankage, blood, azotine, castor pomice, sulphate of ammonia, nitrate of soda, sulphate of potash, silvernite, and kainit. They have the following brands registered in this department :

Ammoniated Orchilla Compound.

Orchilla Guano.

Travers' Sweet Potato Fertilizer.

" Truck Fertilizer.

Beef, Blood and Bone.

Wheat and Grass Fertilizer.

National Tobacco Fertilizer.

" Fertilizer.

Capital Truck Fertilizer.

" Tobacco Fertilizer.

" Peanut Fertilizer.

" Cotton Fertilizer.

" Bone and Potash Fertilizer.

" Dissolved S. C. Bone.

Champion Corn Grower.

" Acid Phosphate.

Special Tobacco Fertilizer.

Standard Dissolved S. C. Bone.

Dissolved " AA " Bone Phosphate.

Pure Raw Animal Bone.

Dissolved " " "

Baldwin's Ammoniated Dissolved Bone.

Kainit.

Travers' Sweet Potato Fertilizer.

JAMES G. TINSLEY & Co., of Richmond, have a factory in that city 140x350 feet, with acid chambers 340 by 60 feet. They work from thirty to one hundred hands. They use in the manufacture of their goods the following materials : Sulphuric acid, S. C. rock, animal bone, tankage, blood, sulphate ammonia, nitrate soda, silvernite, kainit.

They have the following brands registered :

Tinsley's Tobacco Manure.

Stonewall Brand Tobacco Fertilizer.

Richmond Brand Fertilizer.
Lee Brand Fertilizer.
Special Plant-Bed Fertilizer.
Sweet Potato Fertilizer.
Stonewall Brand Acid Phosphate.
Tinsley's Wheat and Grass Fertilizer.
McGavock's Special Potash Mixture.
Tinsley's Ten Per Cent. Plant Grower.
Cabbage Manure.
Stonewall Brand Fertilizer.
Tinsley's Bone and Potash Mixture.
Pure Animal Bone.
Dissolved S. C. Bone.
Tinsley's Dissolved S. C. Bone.
 " Potato Mixture.
 " Irish Potato Guano.
 " Vegetable Guano.
 " Stonewall Guano.
J. F. Walton's Special Tobacco Guano.
Powhatan Corn Guano.
Bone and Potash Mixture.

MANUFACTURERS WHO DO NOT SELL OVER ONE HUNDRED TONS OF FERTILIZER.

BOGGS & WATERS, of Nandua, have their brand, "Special," registered in the department. They have no factory, their goods are manufactured for them.

GEO. K. COINER, of Waynesboro, has bone mill near that town. They have one brand registered, "Pure Raw Bone Meal."

DECKER & ALRICH, of Fredericksburg, have one brand registered in the department, "Button Bone."

GRIM & HAYMAKER have bone mill near Winchester, Va. They have one brand: "Grim & Haymaker's Pure Raw Bone," which is registered.

S. GRINELS & SONS have factory near Grinels, Va. They have one brand registered, "Grinels' Farmers' Favorite Fertilizer."

ROBT. T. KNOX & BROS., of Fredericksburg, have one brand of fertilizer registered in this department, "Knox's Bone Compound." Their factory is located near Fredericksburg.

A. H. LINDSAY, of Portsmouth, Va., has one brand, "Cumberland Four Per Cent," which is registered.

MASLIN, WAYLAND & COINER, of Waynesboro, have one brand registered, "Pure Raw Bone Meal."

WM. A. MILLER & SON, of Lynchburg, have one brand registered in this department, "Miller's Pure Raw Bone."

WITZ & HOLT, of Staunton, have factory in that city. They grind bone. They have one brand registered: "Pure Raw Bone Meal."

J. D. BELOTE & SONS, of Savageville, Va., have two brands registered: "Special Irish Potato Guano," "Special Sweet Potato Guano," They sell one hundred tons per annum.

F. C. BERBERICK has factory near Petersburg, Va. He grinds one hundred tons of bone. Has one brand registered, "Pure Bone."

JOSEPH L. BICKERSTAFF & Co., of Richmond, have factory located in Henrico county. They grind bone. They sell about one hundred tons of the following brands. Their goods are registered:

Pure Ground Bone.

Flesh, Blood and Bone.

Flesh and Blood.

G. H. WAKEMAN, of Waterlick, Va., has three brands registered as follows:

Common Sense High Grade Raw Bone Phosphate.

Common Sense Raw Bone Phosphate.

Massanutton Pure Home Ground Raw Bone Meal.

LIST OF MANUFACTURERS.

The following is a list of manufacturers, registered according to law, in this State :

Allen's Sons, J. J., Philadelphia, Pa.
Allison & Addison, Richmond, Va.
Alexandria Fertilizer and Chemical Co., Alexandria, Va.
American Fish Guano Co., Harborton, Va.
American Fertilizing Co., Norfolk, Va.
Armour & Co., Chicago, Ill.
Armour Packing Co., Kansas City, Mo.
Alliance and Industrial Union Mfg. Co., Ellersons, Va.
Atlantic and Virginia Fertilizer Co., Richmond, Va.
Atlanta Guano Co., Atlanta, Ga.
Baltimore Guano Co., Baltimore, Md.
Baugh & Sons Co., Baltimore, Md.
J. D. Belote & Sons, Savageville, Va.
Baltimore Pulverizing Co., Baltimore, Md.
Berberick, F. C., Petersburg, Va.
Bickerstaff & Co., Jos. L., Richmond, Va.
Baker & Co., Winchester, Va.
Blackstone Guano Co., Blackstone, Va.
Boggs & Waters, Nandua, Va.
Bonday, Jas., Jr., & Co., Baltimore, Md.
Bradley Fertilizer Co., Boston, Mass.
Bryant, Herbert, Alexandria, Va.
Bunting & Sons, J. W., Chincoteague, Va.
Carrington, Clement & Co., Lynchburg, Va.
Catt, Reeves & Co., Staunton, Va.
Chesapeake Guano Co., Baltimore, Md.
Chemical Co. of Canton, Baltimore, Md.
Cincinnati Dessicating Co., Cincinnati, O.
Clark's Cove Fertilizer Co., New York city.
Cockrell & Reed, Reedville, Va.
Coiner, Geo. K., Waynesboro, Va.
Davie & Whittle, Petersburg, Va.
DeLasmutt, E. E., Frederick, Md.
Durham Fertilizer Co., Durham, N. C.
Detrick Fertilizer and Chemical Co., Baltimore, Md.
Decker & Alrich, Fredericksburg, Va.
Denniss, L. E. P., & Sons, Crisfield, Md.
Edisto Phos. Co., Charleston, S. C.

Excelsior Guano Co., Baltimore, Md.
Farmer, W. S., & Co., Baltimore, Md.
Freeman, E. B., & Co., Norfolk, Va.
Grim & Haymaker, Winchester, Va.
Griffith, W. R., Baltimore, Md.
Graham, J. E., Staunton, Va.
Griffith & Boyd, Baltimore, Md.
Grinels, S., & Sons, Grinels, Va.
Henrico Sanitary Co., Manchester, Va.
Hinton, Toulson & Co., Mila, Va.
Hill, John R., South Boston, Va.
Horner, Joshua, Jr., & Co., Baltimore, Md.
Hubbard & Co., Baltimore, Md.
Hubbard, M. P., & Co., Baltimore, Md.
Humphreys & Tilghman, Salisbury, Md.
Imperial Guano Co., Norfolk, Va.
James River Marl and Bone Phosphate Co., Richmond, Va.
Knox, Robert T., & Bro., Fredericksburg, Va.
Lazaretto Guano Co., Baltimore, Md.
Liebig Manufacturing Co., Cartaret, N. J.
Lindsey, A. H., Portsmouth, Va.
Lister's Agricultural Chemical Works, Newark, N. J.
Lippitt, W. F. & T. P., Charlestown, W. Va.
Mapes, F. & P. G. Co., New York city.
Maryland Fertilizer and Manufacturing Co., Baltimore, Md.
Maslin, Wayland & Coiner, Waynesboro, Va.
Maryland Fertilizer and Mfg. Co., for B. H. Read, Baltimore, Md.
Magrath & Chesley, Fredericksburg, Va.
May, W. H., & Son, Alexandria, Va.
McMenamin & Co., Hampton, Va.
Miller, Wm. A., Lynchburg, Va.
Moomau & Crumpacker, Bonsacks, Va.
Mount Airy Manufacturing Co., Baltimore, Md.
N. W. Fertilizing Co., Chicago, Ill.
Ober & Sons Co., G., Baltimore, Md.
Old Dominion Guano Co., Norfolk, Va.
Patapsco Guano Co., Baltimore, Md.
Powers, Gibbs & Co., Wilmington, N. C.
Peninsula Sanitary & Manufacturing Co., Hampton & Newport News, Va.
Pollock, R. H., Baltimore, Md.
Powell, W. S., & Co., Baltimore, Md.
Quinnipiac Co., Cartaret, N. J.
Ramsburg Fertilizer Co., Frederick, Md.
Rasin Fertilizer Co., Baltimore, Md.
Reid, Chas., & Sons, Norfolk, Va.
Reese & Co., John S., Baltimore, Md.
Roberts & Co., H. S., Westminster, Md.
Richmond Guano Co., Richmond, Va.
Scott Fertilizer Co., Elkton, Md.

Slingluff & Co., Baltimore, Md.
Shanley & Van Brunt, Beverly, N. J.
Shoemaker & Co., M. L., Ltd., Philadelphia, Pa.
Swift & Co., Chicago, Ill.
Sharpless & Carpenter, Philadelphia, Pa.
Standard Guano Co., Norfolk, Va.
Standard Soft Phosphate Co., Alexandria, Va.
Susquehanna Fertilizer Co., Baltimore, Md.
Thomas & Son Co., I. P., Philadelphia, Pa.
Tygert-Allen Fertilizer Co., Philadelphia, Pa.
Tygert Co., J. E., Philadelphia, Pa.
Travers & Co., S. W., Richmond, Va.
Tinsley & Co., J. G., Richmond, Va.
Taylor & Tredwell, Norfolk, Va.
Wakeman, G. H., Waterluk, Va.
Venable, A. R., Jr., Richmond, Va.
Walton & Whann Co., Wilmington, Del.
Webster & Son, S. L., Cambridge, Md.
Witz & Holt, Staunton, Va.
Wright & Craighill, Lynchburg, Va.
Wilcox & Gibbs Guano Co., Charleston, S. C.
Williams & Clark Fertilizer Co., New York city.
Wooldridge Fertilizer Co., Baltimore, Md.
Zell Guano Co., Baltimore, Md.

APPENDIX.

ARRANGEMENT.

By order of the State Board of Agriculture, the following papers are published with the annual report of the Commissioner of Agriculture, to-wit:

Sweet Potatoes. Report by Louisiana Experiment Station.

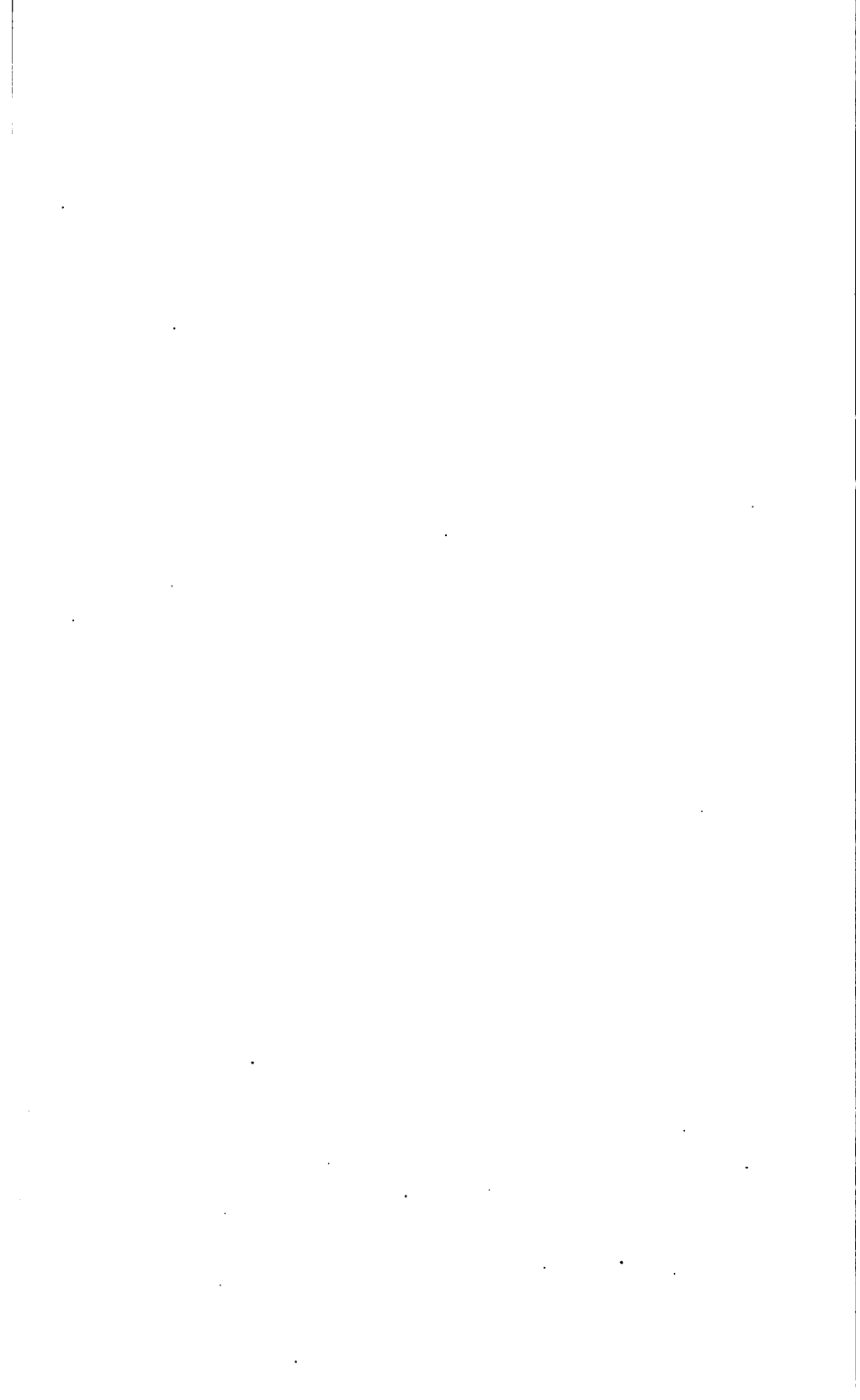
The San Jose or Perniciosus Scale, by C. V. Riley.

Address before Immigration Convention, Richmond, Va., October 16, 1894, by Dr. Paul Menzel.

Address before Immigration Convention, Richmond, Va., October 16, 1894, by Judge Charles Grattan.

Address before Immigration Convention, Richmond, Va., October 16, 1894, by Captain J. B. Baylor.

Address before the Virginia Good Roads Convention, Richmond, October 18, 1894, by Clarence Coleman.



APPENDIX.

SWEET POTATOES.

Report on Sweet Potatoes from Louisiana Experiment Station, issued by State Bureau of Agriculture of Louisiana.

In 1890 a special bulletin on this subject was published, giving a description, with chemical analyses, of fourteen varieties. In 1892 further trials with an increased number (twenty-three) were made and results published in Bulletin No. 22. Since that time, by diligent effort, the number of varieties under cultivation has been increased to thirty-six, five of which have been imported from Java. Much time and expense have been spent in trying to properly classify these so called varieties and adopt a nomenclature, which can be followed throughout the country, but so far, only with partial success. Differences in soil and climate have perhaps modified changes in the plant, and hence complicated the prevailing conditions. We find slight differences in some varieties, and yet these differences are emphatic and prohibit identical classification.

Strenuous efforts have been made to obtain true seeds, the blooms (in the aggregate over eight hundred) have been sacked and only eleven imperfect seed obtained. It is therefore believed that no mixing of varieties has occurred at Baton Rouge. At Audubon Park the stiff, strong soil prevents, even with the greatest care, the removal of all the potatoes. The winters are mild and in the spring the old potato patches are covered with volunteer vines. From these vines are obtained cuttings for the future crop. In this way the potato crop has been propagated for several years. When first planted there were used only two varieties, one a red and the other a yellow potato, both inferior in quality. The next year a dozen or more vines of the Barbadoes, Hayman, Georgia and Sugar Yams were brought from Baton Rouge and planted among the others. Since that time the volunteer vines in spring have furnished plants for each year's crop. These vines in August and September are literally covered with blooms, and it is believed that they have produced seed, which subsequently germinated in quantity, since the potatoes now on hand are unlike those originally planted, the red potato having disappeared entirely. These facts are given as indicating the true solution of the mixing of sweet potatoes when grown some time on the same ground. It is hoped next season to propagate plants from the true seed.

The extensive cultivation and use of this plant all over the Southern States renders a careful study and comparison of the different varieties, necessary from both an economical and dietetical standpoint. That the variations in yield as reported by the Bureau of Agriculture for 1893, from the different parishes, are due largely to the use of different varieties may be asserted without fear of successful contradiction, if one may judge from results at this station. The entire State is credited with a yield not far from 3,000,000 bushels, with a variation in yield from

75 bushels per acre in Caldwell, Concordia, Orleans and Washington parishes to 34 bushels in Lafayette. Even the maximum yields are far below the attainable; since our experiments at Baton Rouge indicate a yield of 400 bushels per acre possible for many varieties. The crop of sweet potatoes of this State for last year occupied about 50,000 acres and yielded a crop of about 3,000,000 bushels, which, at 50 cents per bushel, gives a valuation of \$1,500,000. While most of this crop is grown for home consumption, increasing quantities are yearly finding their way to Northern markets. The main crop at Baton Rouge was planted May 1. The land used was the same plot which had been in sweet potatoes, the two seasons previous, and no manure was used for the variety list. It was thoroughly prepared and ridges laid out three and one-half feet apart. They were kept clean by cultivating and hoeing, until the vines hindered work, after that no cultivation was given.

August 15, a second planting of all the varieties was made, using cuttings from the running vines. This was done, to find out, if at that late day any aid could be given to the farmers, whose lands by any means became overflowed.

In the table, which is to follow, will be found the record of the regular crop, together with the late crop, giving in the latter case the percentage of edible roots of each variety. As a crop they have produced very heavily this year, having no drawbacks, and not being affected by the drought.

TABLE SHOWING QUALITIES AND PRODUCTION OF EARLY AND LATE CROPS.

No. Experiment.	VARIETY.	CHARACTER WHEN COOKED.			Time of Ripening.	YIELD IN BUSHELS. PLANTED MAY 1.			Yield in Bushels when planted August 15th.	Per cent—Merchantable.
		Color.	Hard or Soft.	Wet or Dry.		Merchantable.	Culls.	Total.		
1	Barbadoes	Nearly white.....	Soft	Medium	Medium.....	499.9	32.04	531.94	36.3	Culls.
2	Bermuda.....	Nearly white.....	Hard	Dry.....	Late.....	302.59	53.09	355.75	51.8	Culls.
3	Big Stem Jersey.....	Light yellow.....	Hard	Dry.....	Medium.....	296.6	24.8	321.4	31.1	Culls.
4	Canal	White.....	Hard	Very dry.....	Medium.....	336.	12.4	348.4	18.1	Culls.
5	Delaware	Light yellow.....	Medium.....	Moist.....	Medium.....	302.85	45.6	348.45	46.6	5 per cent.
6	Dog River	Dark yellow	Hard	Dry.....	Late.....	160.2	16.	176.2	93.3	Culls.
7	Early Golden	Yellow.....	Medium.....	Dry.....	Medium.....	514.4	16.02	530.42	145.2	50 per cent.
8	Georgia.....	Yellow.....	Medium.....	Medium.....	Late.....	560.05	20.8	580.85	67.4	5 per cent.
9	Gold Skin	Yellow.....	Rather soft.....	Medium	Medium.....	257.2	29.5	286.7	103.7	10 per cent.
10	Hayman	Light yellow.....	Medium.....	Dry.....	Late.....	638.8	12.4	651.2	155.5	10 per cent.
11	Matejito.....	White.....	Hard	Dry.....	Medium.....	373.3	12.	385.3	13.	Culls.
12	Negro Choker	Nearly white.....	Hard	Dry.....	Late.....	489.5	35.2	524.7	10.3	Culls.
13	New Jersey	Nearly white.....	Medium.....	Medium.....	Medium.....	240.7	48.2	288.9	31.1	Culls.
14	Norton	Nearly white.....	Soft	Medium	Late.....	638.	16.	654.	114.	5 per cent.
15	Peabody	Yellow.....	Hard	Dry.....	Late.....	684.5	12.4	696.9	186.6	30 per cent.
16	Padisha	Yellow.....	Soft	Wet.....	Medium.....	340.18	8.29	349.47	197.	60 per cent.
17	Pumpkin	Yellow.....	Hard	Dry.....	Late.....	299.6	24.8	324.4	82.9	Culls.
18	Providence	Yellow.....	Soft	Wet.....	Early.....	1057.8	14.5	1072.3	124.4	80 per cent.
19	Red Nansemond	Yellowish white.....	Medium.....	Wet.....	Late.....	696.9	20.7	717.6	228.	75 per cent.
20	Southern Queen	White.....	Rather hard.....	Dry.....	Late.....	622.2	18.6	640.8	114.	50 per cent.
21	Strasburg	Light yellow.....	Rather hard.....	Dry.....	Late.....	352.6	35.2	387.8	186.6	50 per cent.
22	Spanish Yam	Light yellow.....	Medium.....	Medium.....	Late.....	501.9	18.6	520.5	114.	Culls.
23	Shanghai or California.....	White.....	Hard	Dry.....	Late.....	741.02	17.6	758.62	41.5	Culls.
24	Sugar or Creole	White.....	Soft	Moist.....	Medium.....	377.5	14.5	392.	82.9	15 per cent.
25	Southern Red Yam	White.....	Hard	Dry.....	Medium.....	539.3	16.02	555.32	134.8	20 per cent.

TABLE SHOWING QUALITIES AND PRODUCTION OF EARLY AND LATE CROPS.—Continued.

No. Experiment.	VARIETY.	CHARACTER WHEN COOKED.			Time of Ripening.	YIELD IN BUSHELS, PLANTED MAY 1.			Yield in Bushels when planted August 15th.	Per cent—Merchantable.
		Color.	Hard or Soft.	Wet or Dry.		Merchantable.	Culls.	Total.		
26	Southern Yellow Yam ...	Yellow	Soft	Wet	Medium...	99.5	10.3	109.8	108.9	5 per cent.
27	Ticotea	White	Soft	Wet	Late	514.4	53.9	568.3	103.7	Culls.
28	Tennessee	Light yellow	Soft	Medium	Medium...	124.4	45.6	170	171.1	15 per cent.
29	Vineless	Light yellow	Soft	Rath. moist	Early	280.5	37.2	317.7	176.3	10 per cent.
30	Yellow Yam	Yellow	Medium	Medium	Medium...	336	45.6	381.6	114	Culls.
31	Yellow Nansemond	Yellow	Medium	Medium	Medium...	170.9	37.2	207.29	51.8	Culls.
32	Java No. 1	White	Medium	Medium	Medium...	204.8	20.8	225.6	72.6	Culls.
33	Java No. 2	Pink	Soft	Wet .....	.....	87.1	41.6	128.7	238.5	25 per cent.
34	Java No. 3	White	Soft	Wet .....	.....	120.3	12.4	132.7	67.4	5 per cent.
35	Java No. 4	White	Soft	Wet .....	.....	64.3	16.02	80.32	82.9	10 per cent.
36	Java No. 5	Dull white	Soft	Wet .....	.....	194.9	24.8	219.7	103.7	30 per cent.

Extensive experiments were made for the past three years in determining the manurial requirements of this crop on this soil. The various forms of nitrogen, phosphoric acid, and kainite were used alone and in combination. A strong application of barnyard manure was also used. The results are not conclusive, and further experiments are needed before decided recommendations can be made. It would seem, however, that a nitrogenous manure, mixed with acid phosphate, in the proportion of two of nitrogen to one of phosphoric acid, would meet the wants of the potato crop on most soils. A mixture of 1,000 pounds cotton seed meal and 300 pounds acid phosphate per acre would nearly furnish the ingredients in the desired quantities.

DISTANCE IN ROW FOR PLANTING VINES.

It is the common practice to plant the vines very close in the row—from four to eight inches—and as there was much discussion in regard to it, experiments along the line of distance in the row have been carried on for the last three years. The following table gives the average of the products obtained during the last three years, with the exception of the last column, which gives the yields of this year only, when cuttings are planted twenty-four inches in the row. From this record it will be seen that on this soil the best distance at which to plant the cuttings is at, or as near as possible, eighteen inches.

AVERAGES OF THE LAST THREE YEARS IN DISTANCE IN ROW.

No. Ex.	DISTANCE.	YIELD PER ACRE IN BUSHELS.	
		MERCHANTABLE.	CULLS.
1	Eight inches	252.07	13.36
2	Twelve inches	258.31	11.01
3	Fifteen inches	275.01	10.48
4	Eighteen inches	281.82	11.71
5	Twenty-four inches (1893)	249.08	15.96

HEIGHT OF ROW.

During the last two years five rows were carefully laid out and the heights carefully adjusted and maintained. The same clean culture was given to each. In the following record will be found the averages for the last two seasons, both in merchantable and unmerchantable roots.

From this will be seen that on this soil a ridge about sixteen inches high will give the best crop, other things being equal. The least amount of culls was produced on ridges twelve inches high and the largest on the level rows.

HEIGHT OF ROW—AVERAGE FOR TWO YEARS.

No. Ex.	HEIGHT.	YIELD IN BUSHELS.	
		MERCHANTABLE.	CULLS.
1	On the level.....	130.03	33.57
2	Four inches.....	219.84	22.53
3	Eight inches.....	197.07	17.33
4	Twelve inches.....	221.59	16.45
5	Sixteen inches.....	261.18	25.45

The subject of lifting the vines during growth to prevent rooting at the joints has been tried during the last two years. The following table shows the results. These two rows were planted and cared for precisely alike except that one was lifted twice a week, and not allowed to become attached to any point, while the other was left entirely undisturbed, and left to take root where it might. The yield of merchantable and culls in both years was much increased where the vines were not disturbed. The vines on a third row during the past year were kept continually pinched and not allowed to extend over two feet. A record of this experiment is also included.

LIFTING EXPERIMENT.

No. of Experiment.	TREATMENT.	YIELD IN BUSHELS PER ACRE, 1892.			YIELD IN BUSHELS PER ACRE, 1893.		
		Merchantable.	Culls.	Total.	Merchantable.	Culls.	Total.
1	Pinched continually (to 2 feet)...	352.49	76.78	429.23	310.2	25.7	335.9
3	Vines left undisturbed.....	226.85	20.94	247.79	294.5	20.	314.5
3	Vines lifted twice per week				257.2	16.5	273.7

The results given are on our soils. On strong, stiff soils, where the tendency to vine is great, contrary results might be obtained. On soils of similar character to ours as well as on poorer soils it would seem wise to let the growing vine severely alone and give it only such treatment as will insure cleanliness.

LENGTH OF CUTTINGS.

For two years experiments with different lengths of cuttings, and cuttings from different parts of the vine, have been made. For the former, lengths from six inches to two feet have been taken from terminals, butts, or middles of growing vine, all of the same length, twenty-four inches. With these have been grown experiments with slips directly from the bed, for comparison. These results would indicate that well rooted slips from bedded potatoes are most profitable for planting. They show also that terminals of vines are better than any other part, and that lengths of twenty-four inches gave larger yields than shorter ones. The following are results:

AVERAGE FOR TWO YEARS IN EXPERIMENTS WITH LENGTH OF
VINES, DIFFERENT PARTS OF VINES AND WITH SLIPS.

No. of Experiment.	TREATMENT.	YIELD IN BUSHELS PER ACRE.		
		Merchantable.	Culls.	Total.
1	Slips 6 inches long.....	210.92	24.71	235.63
2	Slips 12 inches long.....	201.96	33.48	235.44
3	Slips 18 inches long.....	277.45	23.22	300.67
4	Slips 24 inches long.....	315.31	21.78	337.09
5	Whole vines exposed every 15 inches	300.24	23.22	323.46
6	Whole vines covered all but leaves.....	190.09	16.28	206.37
7	Terminal end of vine.....	340.46	22.48	362.94
8	Middle portion of vine.....	329.97	15.89	345.86
9	Butt end of vine	264.63	21.48	286.11
10	Slips.....	352.60	33.10	385.70

In the matter of storing our experience has been varied. Our varieties have been always kept in open boxes inside the large brick building, used by the Departments of Horticulture and veterinary science.

This building has walls five and one-half feet thick, having been a powder magazine belonging to the United States barracks, and therefore its temperature as a rule is very even. During the early fall there was considerable rotting among the varieties, but this was very effectually dealt with by thoroughly sorting the potatoes, cleaning the boxes, and dusting well both boxes and potatoes with *Fostite*. This we found to be all that was needed in regard to the rot among the seed potatoes. A full description of this fungicide will be given with the diseases. During the last winter the general crop kept splendidly, simply piled inside the stable, with no protection other than a light covering of hay.

A few important points must be observed in keeping potatoes—viz: absence of moisture and equable temperature above freezing point. Therefore potatoes should be dug in dry weather and put away securely against moisture and severe alterations of temperature. No bruised or cut potato should be left in those intended for preservation, as sooner or later it will become affected and inoculate the whole mass.

THE SAN JOSE OR PERNICIOSUS SCALE.

(*Aspidiotus perniciosus* Comstock.)

BY C. V. RILEY.

PAST HISTORY.

In the Annual Report of the Department of Agriculture for 1880 Professor J. H. Comstock described under the above names an insect which he had personally collected in Santa Clara county, California, upon apple, pear, plum and other deciduous trees. The scale and body of the female were described, and the scale of the male. The early stages of the insect and the adult male did not, however, receive treatment, except that the bare statement is made that the eggs are white. Professor Comstock stated that from what he had seen of the species he considered it to be the most pernicious scale insect known in this country. He had never seen any other species so abundant as this was in certain orchards. He was told that it infested all the deciduous fruits grown in California, except the peach, the apricot, and the Tartarian cherry. As a remedy he suggested the use of strong alkaline washes. The scale was not illustrated, but the anal plate of the adult female was shown upon Plate XII.

The San Jose scale has received no original treatment in eastern publications since that time. It has remained confined to the Pacific coast, but has extended north to Washington and south to the Mexican border, from the point where it was studied by Professor Comstock, and has become, perhaps, the chief enemy to Pacific coast horticulture. Considerable attention has naturally been paid to the species by California horticulturists. In 1883 Matthew Cooke published very poor figures of the larva, male pupa and adult male, together with the adult female scales on twig and fruit. He stated that the insect was first noticed by fruit shippers as infesting fruit in 1873 at San Jose, Santa Clara county. From that time it spread rapidly until 1880, and but little effort was made to exterminate it. In the winter of 1881-2 crude petroleum was applied extensively, in some cases with good results, but in the majority of instances with great harm to the trees, many trees dying from the effects. Mr. Cooke found it upon currant bushes, on tomatoes grown in the vicinity of infested trees, and also upon poplar, orange, wild cherry, eucalyptus, and other ornamental trees and shrubs. Very brief descriptions were given of the young larva and the adult male, and the remedies recommended were one pound concentrated lye to a gallon of water, six pounds caustic soda to twelve ounces of potash, and eight gallons of water. These remedies were only to be applied at the dormant season. While the tree is in leaf one pound of whale-oil soap, one-third pound of sulphur, and one ounce and a half of lye or caustic soda to a gallon of water were recommended.

In 1884 the late Dr. S. F. Chapin, in his biennial report as State Inspector of Fruit Pests, mentioned the San Jose scale, but stated that in Santa Clara county, where it first appeared, there had been a most gratifying decrease in its numbers and in the destructive effects following its presence; both results having been brought about by the intelligent and well-directed efforts of the fruit-growers. He stated that the scale had been found at that time in many different localities in the State, but had not caused any great decrease in orchard products. He urged that the pest be watched and destroyed in its incipency, but this excellent advice was not followed, as the sequel will show.

In the biennial report of the State Board of Horticulture of California for 1885-6 the late W. G. Klee, then State Inspector of Fruit Pests, published a short account of the insect, illustrating its characteristic appearance upon twig, leaf and fruit in a very good colored plate, and reproducing Matthew Cooke's poor figure of the male. Mr. Klee stated that the insect has three distinct broods—one in June, one in August, and one in October—but that these broods overlap, and that in consequence the summer washes are not thorough remedies, unless frequently repeated. He therefore recommended winter treatment, consisting of a cutting back and thorough thinning of all trees above twenty feet in height, together with thorough scrubbing of the old, rough bark of the trees and the application of one-half pound of concentrated lye, one-half pound commercial potash, and five quarts of water.

In the proceedings of the eighth Fruit-Growers' Convention, published in the report of the State Board of Horticulture for 1887-8, Professor C. H. Dwinelle is said to have reported the most perfect success in fighting the San Jose scale in Sonoma county, California. A seriously infested orchard was treated with complete success by means of a wash composed of one-half pound commercial potash, one-half pound caustic soda, and five quarts of water. This was applied when the trees were in a dormant condition. Mr. Klee's report as State Inspector of Fruit Pests, in the same volume, referred to the continual spread of the scale to new regions in the State, and announced the finding of a new parasite.

In the report of the same board for 1889 a reprint is given of Comstock's description in an article upon scale-insects and remedies, presumably compiled by the secretary of the board. Several formulas for summer and winter use are given, the most successful of which, and the one which has come into most general use, being the so-called lime sulphur salt wash for winter use. This wash consists of 40 pounds of unslaked lime, 20 pounds sulphur, 15 pounds stock salt, and water to make 60 gallons. The summer washes comprise potash and caustic soda, or whale oil, soap, and sulphur, with a slight admixture of caustic soda and potash, or a mixture of tallow and resin with a small quantity of caustic soda and potash. This matter is substantially repeated in the report of the board for 1891. In the same volume Mr. Alexander Craw published an article entitled "Insect Pests and their Extermination," in which he devotes two paragraphs to this species. He considers it to be a very serious pest of deciduous trees, but states that the remedies just mentioned are so cheap and effective that, if properly applied, no excuse can be tolerated for a seriously infested orchard. He further states that a Chalcid fly—*Apheleus fuscipennis* Howard—had been found doing such effective work in subduing this species in an orchard in the neighborhood of Los Angeles, that a complete restoration of the orchard was confidently expected.

The first appearance of the insect in the State of Washington was probably

about 1888-'9 (see *Insect Life*, Vol. III, page 69). In 1891 Mr. Ed. M. Ehrhorn, at a meeting of the California Entomological Society held May 2, read a paper upon the San Jose scale, and stated that he had reared from it *Aphelinus fuscipennis* Howard, *Coccophagus citrinus* Craw, and *Aphelinus mytilaspidis* LeBaron.

In Bulletin 26 of this Division, Mr. Coquillett, in his report on the scale insects of California, devotes four pages to this new species. He states that its origin is uncertain, but that the fact of its being so frequently found upon plants imported from Japan would seem to point to that country as its original home. He states that the species never attacks citrus or coniferous trees, and that the LeConte pear, when growing in the midst of other varieties of pear, is almost exempt. The twice stabbed Ladybird is mentioned as being the most abundant and efficacious enemy of the scale, although Mr. Coquillett has never known an instance where even one single tree has been entirely or very nearly freed from the scale by the work of this beetle. *Aphelinus fuscipennis*, he states, occurs in large numbers on this scale insect. It breeds throughout the year, and he has reared specimens as late as November 10th, it does not, however, appear to be able to keep the species in check. The article concludes with a series of experiments with washes, the result of these experiments was that the resin and caustic soda wash recommended by Mr. Coquillett in Bulletin 23 of the division was found to be superior to the others. This wash is to be applied only during the dormant season, and consists of 30 pounds of resin, 9 pounds of 70 % caustic soda, $4\frac{1}{2}$ pints fish oil, and water to make 100 gallons. Mr. Coquillett's testimony as to the good offices of *Chilocorus bifulderus*, coincides with that of other observers, but a surprising instance, which indicates that the species may occasionally prove extremely effective, was mentioned in the California Fruit Grower in 1892. It was there stated that Mr. N. W. Motheral procured a number of these beetles in San Diego county (date not given) and placed them in some orchards in Tulare county which were badly infested with the scale. They did not appear to multiply greatly until the spring of 1892, when immense numbers appeared simultaneously and completely cleared the orchards of the county of the scale.

An interesting ladybird of the genus *Scymnus* was found in 1892 by Dr. Blaisdell preying upon the San Jose scale at the Coronado Parks near San Diego. This species was described by Dr. Blaisdell as *Scymnus lophanthæ* n. sp., and has not proved very effective in destroying the *Aspidiotus*. As I pointed out in *Insect Life*, Volume V, pp. 127-'8, this insect is one of the Australian Coccinellidae, sent or brought over by Mr. Koebele on his first trip to Australia in 1888-'89. I cannot find that the species was described previously to Dr. Blaisdell's description, but the species is closely allied to *Scymnus fagus* Broun of New Zealand. The species has evidently established itself in Southern California.

In the September, 1892, number of the Agricultural Gazette of New South Wales, Mr. A. Sidney Olliff reported the receipt of a typical series of *Aspidiotus perniciosus* on the fruit, leaves and twigs of pear from West Maitland, N. S. W. Mr. Olliff further stated that although this species had not previously been recorded as occurring in Australia, it had been known to some fruit growers for a number of years. In an important paper read by Mr. Alex. Craw before the State Horticultural Society of California, December, 1892, the San Jose scale is stated to be unquestionably of foreign origin, and it is further surmised, on the authority of Mr. John Britton of San Jose, that it was introduced into California upon trees received from Chile by the late James Lick.

In Bulletin 7 of the New Mexico College of Agriculture, published in June, 1892, Mr. C. H. Tyler Townsend, entomologist of the station, records the occurrence of the species at Las Cruces upon apple, pear, plum, peach, quince and rose, and states that it was brought into New Mexico on young trees from California. The winter eggs are mentioned in Mr. Townsend's account as turning orange yellow in spring and hatching the first or second week in May.

SUDDEN APPEARANCE OF THE SPECIES IN THE EAST.

The first week in August of the present year, Dr. C. H. Hedges, of Charlottesville, Va., sent specimens of pears and peaches affected by this insect to the Division of Vegetable Pathology of this department, on the supposition that the scales were the manifestation of a fungus disease. They were referred to me, and I immediately wrote to Dr. Hedges informing him of the destructive character of the insect, advising him to spray with kerosene emulsion, as examination of the specimens showed that the insects were hatching at the time, and urged him to inform me, if possible, as to the means by which the species had become established in his orchard. In his reply he states that he had begun to spray, but that he could not trace the origin of the trouble. He sent specimens from pear, currant, plum, Japanese plum, and dwarf apple.

In view of the great importance of the subject, Mr. E. A. Schwarz was sent to Charlottesville about the middle of August to make a thorough investigation, and in December Mr. D. W. Coquillett was sent to continue them and to definitely delineate the area of infection. From the detailed report which Mr. Schwarz has submitted, it appears that the scale occurs most abundantly in a little pear orchard forming a square of about one-third of an acre about one-third of a mile from the centre of the city, adjoining one of the main roads leading into the open country. The orchard is practically isolated, being bounded upon one side by a vineyard, on another by a garden of a neighbor, on a third side by the road, and on the fourth by a lawn. It is planted with choice dwarf fruit trees—mainly pears. They are crowded together, and in many cases the branches interlock. The orchard was set out about eight years ago, and is now very badly infested. The quince and Japan persimmon carry no scales; a few occur upon dwarf apples and a few upon peaches. The Lawrence pear was also but slightly affected. The Duchesse d'Angoulême and its varieties, and the Bartlett and its varieties, are very badly attacked, particularly the former. Raspberry bushes are not affected, but currant bushes are covered. A few specimens also occur upon rose bushes. Two hundred feet away from the infested orchard, and in the middle of the vineyard, other apple, peach, and pear trees occur, but all are absolutely free from scales. Two old apple orchards at a very considerable distance were also absolutely free. In point of fact, the insect has not spread to the north, east, or west. Towards the south, however, it has spread to some extent into the garden of a neighbor. This is a flower garden, but contains a few scattered fruit trees. In this garden the scales were found in moderate numbers on a peach tree, or some pear trees, and on two rose bushes. Still further south is another garden belonging to a neighbor, and in this garden a few specimens of the scale were found upon a single pear tree.

The insect is therefore definitely limited and confined to a small space, and there seems to be no doubt that the species made its first appearance in Dr. Hedges' pear orchard. It is also undoubtedly a recent importation, since the orchard was planted only eight years ago, and since the species has spread so slightly.

Mr. Schwarz was able to gain no definite information concerning the mode of importation. Dr. Hedges has never bought any nursery stock or other plants from California. His oldest trees were purchased eight years ago in New York. Certain others were purchased in Augusta, Ga., three years ago, and two years ago another lot was obtained from Crozet, Albemarle county, Virginia. The time of purchase of the last lot coincides with the time when the scale was first noticed, but Dr. Hedges is positive that these trees were not infested when purchased, and states that the scales were first noticed at another point in the orchard among the oldest pear trees, near certain old currant bushes which died and were removed before the scales were noticed upon the trees. Mr. Schwarz then inquired as to the history of these currant bushes, and ascertained that they were purchased eight years ago from a New Jersey nursery. Dr. Hedges thinks that they died from a scale-insect attack, but since this was long before the scales were noticed in the pear trees, the statement is doubtful. Moreover, had the insect been originally introduced upon currant bushes eight years ago, the whole orchard would probably been infested long since, and the insect would have spread to a much greater distance. The question as to the mode of importation is, then, surrounded with considerable difficulty, and it would seem, at the first glance, more plausible that the insect had become accidentally established from California fruit than from nursery stock. This was the conclusion to which Mr. Schwarz came after his investigation. He found that California pears are sold in the fruit stores of Charlottesville and also upon the trains of the Richmond and Danville railroad passing through the city. He therefore suggests the plausible idea that some person passing along the highway had tossed the rejected portions of a pear over the fence, and that from this small beginning the difficulty originated. In support of this view it may be stated that the insects gather by preference in the pit around the calyx end of the fruit, where they are not likely to be noticed, and from which point they cannot be rubbed in polishing the fruit with a cloth. Against it, however, is the further fact that I have never noticed a single specimen of this insect on California pears in Washington markets. Its appearance is so characteristic that it could hardly fail to attract the attention of an entomologist, and yet none of my assistants have ever seen one, although California pears are extremely abundant on the fruit stands of Washington, as in most of our eastern cities. Moreover, the greatest care is exercised in California to offer only perfectly clean fruit for sale, and there are State laws prohibiting the sale of infested fruit. I noticed two years and a half ago a case reported in the California Fruit Grower where a Riverside fruit dealer was fined \$10 for selling fruit infested with this scale insect, and since that time the law has been more or less rigidly enforced. Moreover, if infested fruit were commonly brought to eastern markets, cases similar to this would have been of frequent occurrence. Indeed, it is difficult to suppose that in this event the species would not have long since obtained a foothold all through the east, since it could easily establish itself upon almost any deciduous plant near which living specimens might find themselves. I am inclined, therefore, to think that while the origin through infested fruit is the most plausible explanation in this particular case, yet the danger of other similar occurrences in other eastern orchards is not great.

The most striking feature in the habits of the scale is its tendency to infest only the extremities of the trees, or the new growth, especially of the lower branches and the fruit. The leaves are attacked (and Mr. Schwarz found this particularly

true of the Duchesse and Bartlett pear trees) along the mid-rib, on the upper side of the leaf, in one, two, or more quite regular rows, and also to some extent along the side ribs, the male scales predominating over the female in such situations. The infested leaves turn purplish brown, but do not have a tendency to fall. No eggs or the remains of eggs could be found by Mr. Schwarz under the female scales at the time of his visit, and usually only one or two larvæ. The species would therefore seem to be viviparous, at least during part of its life cycle, though eggs are mentioned by both Comstock and Townsend in their records and observations. While three generations have been observed in California, there would seem to be, from Dr. Schwarz's notes, no definite succession of generations, but a gradual hatching, or rather a gradual birth.

NATURAL ENEMIES AT CHARLOTTESVILLE.

No parasites, and no scales from which parasites had issued, were observed at Charlottesville. The common little Malachid beetle, *Collops quadrimaculatus*, was observed feeding in small numbers upon the newly hatched larvæ. The Coccinellid beetle, *Pentilia misella*, and its larvæ were very abundant on the infested trees, and this species, Mr. Schwarz thinks, is a very important enemy of the scale. The beetles seem to prefer the full-grown female scales, while the larvæ feed upon *Aspidiotus* larvæ. The larvæ customarily transform to pupa within the calyx of the pears. This little cavity was always found literally filled with a mass of young and old scales, full grown *Pentilia* larvæ and pupa, and recent imagoes. The fact that this beetle, which is essentially an eastern species, so readily and effectively began to feed upon this introduced scale, is a very interesting one entomologically, and would justify an effort to introduce and colonize it in southern California.

HOW THE SPECIES IS DISTRIBUTED LOCALLY.

Some interesting observations were made by Mr. Schwarz upon the transporting of the young Coccid larvæ by other insects. This very *Pentilia* was unconsciously an active agent in this dangerous work. Hardly one of the beetles could be found which did not carry on its back at least one *Aspidiotus* larvæ, and sometimes three or four were found upon a single wing-cover of a beetle. A small black ant, *Monomorium minutum*, was abundant upon the pears, attracted by the juice emerging from the cracks, and almost every one of those ants carried on its back one or more specimens of the Coccid larvæ. Specimens of a little Chrysomelid beetle, *Typophorus canellus* were also found upon the trees. Red and black specimens of these beetles occurred, and the interesting observation was made that while the *Aspidiotus* larvæ crawled freely upon the black individuals, no specimens were to be found upon the red ones. This same peculiar fact was also found to hold with the ants, since the red ant, *Formica schaufussi*, was abundant upon the pears, but no specimens were found bearing *Aspidiotus* larvæ, while, as just stated, the little black *Monomorium* was always found carrying specimens. Curiously enough, no ladybirds other than *Pentilia* were seen. The common twice-stabbed ladybird, *Chilocorus bivulnerus*, which is so active an enemy of scale-insects and plant-lice throughout the Southern States was absent.

STAMPING OUT THE SPECIES AT CHARLOTTESVILLE.

Believing, from Mr. Schwarz's report, that the area in which the insect occurs around Charlottesville is yet limited, and feeling the importance of effectual steps

being taken to stamp it out, because of the danger to the rest of the State of Virginia and to the whole Atlantic fruit region, of its future spread, I was anxious to still more definitely delimitate its range ; and Mr. D. W. Coquillett, who has had much experience with the insect in California, was directed to make a second survey of the field. He spent some time at Charlottesville in December, and his report fully confirms the observations of Mr. Schwarz, and shows that the species is yet limited to the region already indicated. Dr. C. H. Hedges and Mr. H. L. Lyman, who have both felt great interest in this matter, in correspondence with the division have shown a willingness to do all that can be done in exterminating it, and the State Board of Agriculture has appealed to the Department for its assistance in this matter. It is my purpose, before the close of the winter, in co-operation with the State Board of Agriculture, to adopt such measures as will effectually stamp it out. The burning of the fruit and leaves and the thorough cutting back of the branches and their destruction by fire, would undoubtedly destroy a large proportion of the insects. But I believe that in a case like this no risk should be run, and that the great bulk of the affected trees should be cut down to the ground and burned. Where it is desirable for any reason to save individual trees, it will be best to use the gas treatment, and in order that this work may be effectually done, I have arranged to have it superintended by myself or some one of my assistants, and to do everything possible on behalf of the Department, to eradicate the insect from this location. It is a matter in which not only the community around Charlottesville is vitally interested, but all the fruit growers of the eastern States.

ADDRESS BEFORE THE IMMIGRATION CONVENTION, RICHMOND, OCTOBER 16, 1894.

BY DR. PAUL MENZEL.

Mr. President and Gentlemen of the Convention :

The German-American Association of Virginia, which I have the honor to represent in this convention, consists exclusively of men who have either been immigrants themselves or who are the sons of immigrants. Some of us have been living in Virginia for a few years or months only, others for a much longer period of time, while the younger generation was born in this our beautiful Southland. But, without any exception, we are all Americans—all Virginians. We love and cherish the dear old State which we have selected in order to build up our homes on its hospitable soil. We are perhaps more able to appreciate the great blessings which a kind Providence has bestowed upon this land than those who never have lived elsewhere. We feel, therefore, most thankful for the great advantages which we enjoy here as adopted children of this old and glorious Commonwealth, and we are only too glad whenever we can do something in order to promote her welfare.

Mr. President and Gentlemen of the Convention, the German-American Association of Virginia, which represents a considerable class of wealthy, intelligent, and patriotic citizens of Virginia, wishes to-day, before all other things, to express its willingness to serve the common interests of our dear State by whatever means that may be in their power.

As to myself, I regret more than I can say, that I am not able to present the views of our organization with all the eloquence of an English-born orator. You will have to bear patiently with the "broken English" of a foreign-born fellow-citizen. Still, I could not lay aside the invitation that was so kindly extended to me to speak here a few words. Since the leading institution of learning in our State conferred upon me in the most unexpected manner the high honor of a D. D. ; since I found myself an Alma Mater, a "venerable mother," in this great Commonwealth, which is known all over the world as the Mother of States and Mother of Presidents, I feel twice duty bound, as a thankful and loving adopted son of Virginia, to devote to her whatever time and strength and power I may have, seeking not my own glory, but the furtherance of her interests as far as lies in me.

And now allow me to try to give you my views, first about—

“THE CLASS OF IMMIGRANTS MOST DESIRED.”

Before I crossed the Atlantic I have lived during thirty-five years in Switzerland and France, in Germany and Scandinavia, and seen other countries of Europe. Besides, I have thoroughly studied history—ancient as well as modern history. The result of my observations and studies has been a profound conviction that at all times and everywhere agriculture is the solid foundation of all true and sound culture. This is clearly demonstrated by the teachings of history as well as by the present condition of all the civilized nations of the world. Wherever agriculture is in a flourishing condition commerce and industry as well as the liberal arts and the higher sciences will develop all their resources, and last, but not least, sound morals will prevail. And again, in the same proportion as agriculture is neglected, everything else will go backward.

Now, no attentive observer will deny that wonderful results have been attained in Virginia during the thirty years that have nearly elapsed since the close of the destructive war between the States. This general progress, not only in agriculture, but also in all other branches of human activity, is all the more to be appreciated since great obstacles had to be overcome as a consequence of the unfavorable and deplorable condition of affairs laid on the shoulders of our people during the sad period of reconstruction. The negro element of our population were not only freed from bondage, but also put on equal political terms with the superior Caucasian race. Their influence soon manifested itself both in city and country; their ignorance, indolence, and impotence stood and stand, everywhere in the way of progress; they are utterly unfitted to contribute anything especially towards the development of agriculture. Other forces are necessary towards such a purpose. But wherever they live in greater numbers, white settlers will not seek nor like to build up their homes.

Hence it is no wonder that wide sections of our State are more or less in a deplorable condition, some of them almost a barren wilderness. Every one who comes from the North will notice this fact as soon as he has crossed the Potomac river.

Besides, our soil is, to a great extent, exhausted. This is partly the natural result of old methods of plantation times. Rational methods of farming, intelligent brains, hands used to hard work are needed in order to bring about a general change for the better. We see what can be made of our lands when we take a drive through the surroundings of our capital city on the James and look at the beautiful farms—for instance, on the Nine-mile road, or elsewhere—where intelligent and skillful farmers, aided by the favors of our superior climate, have succeeded in such a wonderful manner. What glorious and blessed State wouldst thou be, O, Virginia, if everywhere such hands were at work to turn the barren sections of thy land into the richest fields and loveliest gardens.

Mr. President and Gentlemen of the Convention, I am to speak about “the class of immigrants most desired.” Were these words meant as a question? It seems to me there is no question about that. The class of immigrants most desired ought to be farmers, honest and God fearing farmers, industrious and intelligent farmers. Let settlements, numerous and well organized settlements of such farmers, arise all over those counties where agriculture is so far from being what it ought to be, and there is no doubt that our dear Old Dominion will before long stand again where it used to stand one hundred years ago, at the head of all the States of our Union!

"THE SECTIONS OR COUNTRIES ABROAD FROM WHICH IT IS MOST DESIRABLE TO SECURE THEM."

Of course you will all expect me now to compose or to execute a certain number of more or less melodious variations over the theme, "Go to Germany!" and, indeed, it would be quite natural for the representative of a German-speaking association to say so: Go to Germany! Still, our answer is altogether different. We do not believe in the advisability of sending any agents abroad, to whatever section or country it may be, in order to secure immigration. Those agents spend their time and the money that is paid out to them without any real beneficial result to us. They feed us with words and phrases, with hopes and expectations, but that is about all. Desirable immigrants are such immigrants who come voluntarily, attracted by real advantages that are already enjoyed by others; men of character and of steady habits, who will not lightly give up their former surroundings, but who then will give themselves with soul and body, as soon as they have found solid foundations upon which to build up something substantial for themselves and their dear ones. Such men need not be sought for, they are seeking for themselves. We need not go far away to look for them; they come and knock at our doors, ready to go to work, if we only encourage them and give them a chance. Far in the West and Northwest the eyes of thousands of settlers are turned eastward with the earnest desire to seek and to find new homes in our midst. Letters of information are written and received daily. During the last year not a few have even personally tried their good fortune. With their wives and children they came to us, bought some land and went to work. But, but—many of them very soon went back again? What was the reason? They found little sympathy and no encouragement at all. Difficulties were even thrown in their way. Others fell into the merciless hands of land agents, who took from them whatever they had earned in the sweat of their faces. Nothing was done in order to secure to our state the useful hands of those people who volunteered to offer us their good services. Thus they became discouraged and left.

Since about a year, an important movement has been organized in Dorchester county, on the eastern shore of our neighboring State (Maryland). Several colonies of western German farmers have been founded there under the auspices of some German clergymen, and with the assistance of many leading business men of Baltimore. Those Germans are poor, but industrious, thrifty and hard workers. They have attained wonderful results in the short period of not yet a full year. From week to week a steady stream of new settlers comes there from the West, and many others are expected to follow, among them not a few who will come directly from the old countries in Europe.

Why should not be possible for Virginia what has proved a great success in Maryland?

Mr. President, we do not wish to be misunderstood if we give the preference to western and northwestern farmers and advise against securing immediate immigration from abroad, at least on a larger scale. We certainly think a great deal of the German farmer. Among those who know something about the development of American agriculture, there can be no question as to the German farmer's usefulness. He has made his influence felt all over our glorious country. He has opened to civilization one great State after the other, from Pennsylvania to the Dakotas and Texas. Even in our own State it is a well-established fact, proved

by all the German names of places and persons which are still found there, that the prosperous condition of Shenandoah Valley is due to the German immigration that came from Pennsylvania about one hundred and fifty years ago.

The German farmer is intelligent and honest, industrious and thrifty, and, above all, a God-fearing man; he is fond of order and peace; not an office-seeker, but always willing to sacrifice his blood and his goods for the country of his choice. He does not go to farming from a mere fancy or from the passing inspiration of a moment; he does what his father and grandfather have done before him, only with the improved methods of the present generation. He and his associates form a regular peasantry with all the traditions of such a body, and will not easily leave his farm for anything else. Happy any Commonwealth where such a peasantry forms the foundation on which everything else is built. We are of the opinion that everything ought to be done by our State authorities in order to create such a peasantry in our State. And if we are not greatly mistaken the present circumstances are exceptionally favorable.

But the way how this may be accomplished is not to induce right away a more or less considerable number of German farmers to leave the Fatherland and to settle in Virginia. Let us first give homes in our midst to those western farmers who have already become familiar with the language and the institutions of our great common country. As soon as they begin to feel at home in dear old Virginia, as soon as they see their way clear before them, as soon as their efforts are crowned with success, they will draw from abroad the most desirable class of immigrants without any extra exertion from our side.

Let us, then, approach such men who are able and willing to serve as leaders; they even come to us out of their own free will. Let us not shake them off by simply directing them to the land agents, but let our Board of Immigration take the matter in hand and organize in such a manner that this Board may provide for them desirable tracts of land, with good soil, good climate, good roads and good communications, and, above all, good titles, in order that they may be able to build new settlements of thrifty white farmers there, where, up to the present day, nothing can be seen but the miserable huts of a few colored people, surrounded by a few acres of land in the most deplorable condition.

We are fully aware of the fact that the German farmers of the West and North-west are not the only ones whose presence would be desirable. It is true, we do not believe that the nations of the Latin race in western and southwestern Europe, or that those of the Slavonic race in the east and southeast of that continent ought to be encouraged to immigrate into our beautiful State. As tillers of the soil most of them have achieved so little in their own countries that we would hardly be greatly benefitted by them. But there are the English, the Scotch and the Scandinavians, all those nations of the north, who descend from one common parentage and are so closely related to us Germans that we might say about them and they about us, what Adam exclaimed when he beheld Eve for the first time: "This is now bone of my bones, and flesh of my flesh." What they have done in the West, as well as in their own countries, entitles them to the same recommendation that we are inclined to give to our German brethren. The only reason why we gave the Germans the preference is that we know that with a little encouragement there are many of them ready and willing to come now. And if we have anything to add to what we already have said about them it would be this: No nation of the world is more apt to get acclimated and assimilated to its surround-

ings than the Germans if you let them go their own way. None make themselves more useful without boasting with their merits or claiming any rewards or distinctions. It is certainly more in the interest of the State than is generally acknowledged to secure that class of immigrants. And every aid that the State gives, especially at the beginning, will before long make itself well paid, yea, with more than hundred-fold interest.

Should our highly esteemed Board of Immigration be willing to take into due consideration any plan of securing and encouraging the class of immigrants we recommend, the German-American Association of Virginia will be happy to do whatever may be in its power in order to co-operate in carrying out such plans in the best and most practicable manner possible.

ADDRESS BEFORE IMMIGRATION CONVENTION, RICHMOND, VA., OCTOBER 16, 1894.

BY JUDGE CHARLES GRATTAN.

There are certain principles underlying the question under discussion that deserve to be considered in determining the class of immigrants we need and the section of the country from whence they may be drawn. One of these is the natural desire of man in changing his location to seek for like surroundings in people, soil, and climate. The love of home is strong in the human heart, and the nearer the approach to it in the new country the more satisfied and the more successful, and therefore the more beneficial to the adopted country, the settler will be. The Switzer is lost when out of sight of the mountains, and the Laplander would be an unprofitable immigrant for Florida.

Another of these principles is we may not look for an exodus from any part of one country to our own. We can only expect the natural overflow. Beside the love of home and the desire to remain amid the friends and scenes of early youth, which will keep the vast majority of our people rooted to their native soil, we must remember that the exodus of a people is only accomplished by the influx of another to take its place, either by the strong hand of war or the milder measure of purchase. The first we do not desire; the latter we cannot expect, since the fact of large bodies of land being thrown on the market in any community lowers its value, and thus decreases the desire to leave and the means wherewith to leave. In my journeys through the North and West I found the inability to dispose of their lands the great obstacle to obtaining numbers of settlers for Virginia.

Still another element in the consideration of this question arises from the incidents of locality that promote a desire to move, and from which objections we are free. Among these we may mention extremes of heat and cold. There are broad sections of our western and northwestern country, of amazing fertility of soil, that are liable to these objections. Blizzards that freeze marrow in the bones of the people, bringing untold misery while they last, and entailing suffering and sickness when they have passed; burning heat that upon rich soils, clothed with luxuriant vegetable growth, breed malaria and fever and leave the strongest and healthiest stalking shadows, unfit for labor or for rest. Droughts that parch the surface of the earth, destroying the hopes of the farmer; floods that sweep the product of the labors of the year to destruction, and leave the land bare of all things save the mortgage it takes to tide over and repair; cyclones that carry death and destruction in their path, leaving the sites of cities bare, the labor and

savings of years, a wreck with only enough living to bury the dead and mourn their loss.

The next question to which we should address ourselves is the freedom of our own State from the ills we have just enumerated and the wide field she offers to settlers from all directions by reason of the great diversity of her surface, soil, and productions.

She is in large measure free from great extremes of heat and cold; the thermometer never rises or sinks so high or so low as it does in sections outside our borders and beyond our barrier mountains, even in the same belt, and notably so in the regions of the North and West. We have changes of temperature, but the blizzards of the Northwest are unknown. Our rainfall is well and evenly distributed, due in large measure to our situation. Having the Gulf Stream some short distance out at sea, the winds that come to us from the east are warmed and take up their load of moisture and deposit it gradually upon the lands rising in elevation, and consequently sinking in temperature from the tides to the tops of the Alleghanies. These things combined give us a health record second to none in the United States, and largely superior to even our new States, whose population is largely composed of those who have passed the danger period of infancy, which, while a gain to them, is a consequent loss to us, as our bone and sinew has been largely expended in building up these new States. Mr. Waddell, in that valuable book, "The Annals of Augusta County," says that in the days long past, when locomotion through our western new States was almost entirely on horseback, two Virginians from Augusta county rode through Ohio, Indiana and Illinois, and for only two nights of their journey stopped at a house of other than settlers who had gone from their own State. Major Peter Woodward, the veteran passenger agent for the Chesapeake and Ohio, who makes his headquarters in Staunton, told me six or seven years ago that up to that time he had shipped over his route to the West as probable settlers, over seven hundred souls from the little county of Highland alone. What, then, would be our health record if with the loss of all this good, healthy blood to us and gain to them we are still ahead of our western neighbors? And what would be the condition of Virginia to-day if this tide of settlers that has built up so much of our western territory by proper education and inducements had remained within our borders!

No country in the world has such a wide extent of surface soil and production, so extensive a field of mineral lands, so accessible and so easily mined, so many, so varied and so excellent fruits, such a wide surface and so profitable a field of fishery, or such fine fish. And by reason of this variety, offers such profitable and varied occupation.

In the light of these facts and principles, let us begin the study of our subject at Tidewater, comprising one-fourth of the surface of the State, with 1,500 miles of navigable water front, and so indented with creeks, inlets, bays, and rivers, that scarcely any portion of it is more than ten miles removed from cheap water transportation. The soil is alluvial and well adapted to the growth of all kinds of vegetables. All the small fruits and berries, clover and timothy, and the higher ridges forming the backbone of the peninsulas that compose this region, admirably adapted to the growth of early lambs, both from the mild climate securing early delivery and cheap transportation, giving these growers a monopoly of the early market. The fish and oysters of this section have a world-wide reputation, and the field is almost illimitable. These fields invite settlers from Eastern Maryland

and Pennsylvania, Delaware and New Jersey, who are accustomed to soil and surroundings in some measure similar. In addition you will find on the southern shores of Lake Erie, in Northwestern Ohio, a race of pure yankees, descendants of Connecticut, New Hampshire, and Vermont sires, who have kept their first estate; are honest, industrious, frugal, and intelligent; their soil is cold and thin, and with their habits and our soil and climate advantages, they would make our tidewater section to blossom as the rose. All along the southern shores of the great lakes, and especially in Michigan, you will find settlers who would find it profitable to come to this section. This morning I saw in your market here celery from Kalamazoo, Mich.; and you can grow it just as good and much cheaper around Atlees, or most anywhere in Tidewater Virginia. The Western Reserve of Ohio, already mentioned, will also give you good and profitable settlers for your sheep walks on the higher lands of your tidewater peninsulars.

The settlers for your fisheries and who will cultivate your oyster farms, you will find all along the coast from the Virginia capes, but especially in Maryland and on the shores of Long Island Sound and the New England coasts.

Middle Virginia, with a light soil easily tilled and that responds readily to the use of fertilizers and manures, and when well handled takes readily in clover, timothy, and orchard grass, produces all the vegetables, fruits, and melons of tidewater, and besides is famous for its yellow tobacco, that brings the highest price in the market. It is finely adapted to sheep culture and the early delivery of lambs.

The countries already mentioned as furnishing settlers to till the lands of tidewater, will furnish good immigrants for this section, and besides those mentioned, Central Maryland and the Connecticut Valley will furnish men suitable for the culture of the finer grades of tobacco, and Central and Eastern Ohio those well qualified to raise sheep and lambs and supply the markets of the North with early lambs, which could here be shipped a month or six weeks earlier than from the Valley or the West, and thus command the high prices always paid for them.

The soils of Piedmont are heavier and more rolling than those of Middle Virginia, and besides the grasses and grains and fruits of that section, here grows in great excellence the heavy shipping tobacco that supplies the German market. This land is well adapted to all the grasses, and is a great growing section and well suited to feeding stock and dairying, besides it is the natural wine and fruit belt of the country. For her heavy tobacco, as well as her dairies, she should seek settlers from York and Lancaster counties and the Cumberland Valley of Pennsylvania; for cattle and sheep feeding, the rolling prairies of Iowa and Minnesota, and for her wine and fruit-growers, from Southern Ohio and Western New York.

The Valley of Virginia is characteristically limestone, and her soil, heavy clays, well adapted to wheat, corn, and the other grains; her great resource is the grass indigenous to her soil, that stamps her a stock-raising, and feeding, and hay-producing section. The Cumberland Valley, York and Lancaster counties, Pennsylvania, Kentucky, the Sciota and Muskingham Valleys of Ohio, Iowa, and Kansas, should furnish her settlers, and as it has been demonstrated by actual test that the quality of the sugar beet which grows luxuriantly here is higher in sugar-producing qualities than in other sections of the United States, she should seek the best sugar growers of Nebraska.

ADDRESS BEFORE THE IMMIGRATION CONVENTION, RICHMOND, VA., OCTOBER 16, 1894.

BY CAPT. J. B. BAYLOR.

Mr. Chairman and Gentlemen:

It is my privilege to speak to you this evening of some of the resources of this great inland bay and its splendid tributaries, upon whose shores we established the first permanent Anglo-Saxon settlement on the American continent, a settlement which led to incalculable results to the human race, whether regarded from a national, a social, or a political standpoint.

If the shores were barren and inhospitable, and the waters as desolate as those of the Dead Sea, all which pertains to them would be of interest. But, on the contrary, as Professor Brooks has said, "the Chesapeake bay is one of the richest agricultural regions of the earth, and its fertility can be compared only with that of the valley of the Nile, the Ganges and other great rivers."

It is the most prolific fishing ground of like proportions in the world. The total harvest from these waters, of oysters alone, has been over one hundred and fifty million bushels during the last ten years. This enormous quantity of valuable food has been practically a free gift from boundless nature.

According to the eleventh census of the United States (Abstract page 180), \$4,816,225 00 worth of oysters and fish were taken during the year 1889 from the Virginia waters alone, and this on a total capital invested of only \$3,429,469 00. Can the very richest land of the west compare in productiveness to this on the same amount of capital invested.

Virginia to-day holds 146,705 acres of natural growth oysters surveyed and duly recorded, and kept for the common use of all who may become citizens of this State. In return for this great privilege she only demands a nominal tax of forty cents on the hundred dollars worth of oysters sold. She still owns thousands of acres of territory suitable for the cultivation of oysters which she is prepared to rent at an annual rental of one dollar per acre, to all who become citizens of the State, giving for a period of twenty years a title which cannot be disputed.

During the fiscal year 1891-'92, from the very latest statistics carefully collected by the U. S. Commissioner of Fisheries, we find that from 916 pound-nets alone, which cost on an average less than \$250 each when put in position, and which are worked not infrequently, by two men, \$514,614 worth of fish were taken from the Virginia waters. \$62,039 worth of crabs, over thirty thousand dollars worth of clams, \$18,494 worth of terrapin were taken from the same waters. Exclusive of oysters, over one million dollars worth of fish were sold, not to mention the canvasback ducks and great variety of other waterfowl. All this valuable food has

been furnished by the State of Virginia to her citizens, free of all cost save only a nominal tax on the assessed value of the apparatus used in taking it. The poorest immigrant can have on these shores an abundance and variety of food for the taking, which only the well-to-do can obtain in most parts of the world.

But, Mr. Chairman, I have as yet said nothing of the transportation facilities afforded by these waters, nor have I dwelt upon the agricultural resources of the shores adjacent to them.

A certain type of critics decry the use of statistics, but every experienced lecturer knows the value of his blackboard and chalk.

Virginia alone has 1,145 miles of coast line subject to tidal action. In Chesapeake bay proper, and in the waters tributary, there are owned and registered, according to the Eleventh Census of the United States, 1,483 vessels and crafts of various kinds, with a total tonnage of 170,520 tons, valued at \$8,673,785, transporting in 1890, 10,953,431 tons of freight, and carrying 4,035,556 passengers.

The figures are significant of much to those who live on the adjacent shores.

The prospective immigrant can be sure that he will find here cheap and certain transportation for the product of his labor to any market of the world. No great corporation can dictate to him what toll he shall pay.

The captain of the largest vessel ever constructed can approach the capes of Virginia with safety. He will hardly have to think of the condition of the weather, nor will he have to study a tidal table to know the stage of the tide. He will find here no dangerous bar, upon whose improvement thousands have been expended, to delay for one single hour his entrance. He will find a great inland bay in which the navies of the world can lie at anchor, which has been traversed by the Great Eastern for more than one hundred and fifty miles. He will not find it necessary to enter any great tidal dock to discharge with ease his cargo at any stage of the tide, and with the wind in any quarter whatsoever. Should his vessel need repairs he can now find here the largest dry dock on the American Continent, and one of the very best equipped ship-building yards in the whole world.

At Norfolk and Portsmouth he will find two great trunk lines of railway, one extending to the remotest cotton region of the South, and the other to the central region of the great West, not to mention several minor lines.

At Newport News he will find a trunk line of railway permeating the West and Southwest with every facility for the handling of his freight and the repairs and construction of his vessel.

At West Point, on one of the many great tributaries of the Chesapeake Bay, he will find a system of railway which permeates the whole South.

Had these facilities existed in the early history of this country, in all human probability what is now New York would be on the shores of Chesapeake Bay.

Let me see what has been their effect upon the foreign tonnage of its ports. From the Chief of the Bureau of Statistics of the Treasury we learn that for the year ending June 30, 1893, there entered the capes of Virginia from foreign countries seven hundred and forty vessels, with aggregate tonnage of eight hundred and seventy-five thousand nine hundred and forty-six tons, bringing imports valued at sixteen million two hundred and fifty-three thousand four hundred and forty-five dollars. During the same year 1032 vessels, with an aggregate tonnage of 1,426,110 tons, passed through the capes of Virginia bound for foreign countries, exporting \$90,899,852 worth of domestic merchandise, the product of agriculture, mining, forests, fisheries, &c.

The business of the principal ports of Chesapeake Bay and its tributaries may be summarized as follows :

For the port of Baltimore, where an inland journey of over 150 miles is necessary, 146 vessels either entered from foreign countries or cleared for foreign countries during the year ending June 30, 1893, exporting and importing \$87,318,460 worth of domestic and foreign products.

For Newport News, 142 vessels either entered from foreign countries or cleared for foreign countries during the year ending June 30, 1893, exporting and importing \$8,144,253 worth of domestic and foreign products.

For Norfolk and Portsmouth, 170 vessels either entered from foreign countries or cleared for foreign countries during the year ending June 30, 1893, exporting and importing \$8,916,849 worth of domestic and foreign products.

For Richmond, 29 vessels either entered from foreign countries or cleared for foreign countries, exporting and importing \$2,488,586 worth of domestic and foreign products.

This is exclusive of the immense coast trade, figures for which have already been given. The bulk of the trade of these ports has grown up within recent years.

What may we not expect in the future? The shores adjacent to these splendid waterways are fast becoming a great garden for the people of the Atlantic coast cities and some of the western cities. Neither the Secretary of Agriculture nor the State Commissioner of Agriculture are able to furnish me with figures giving the value of the trucking interests separate from the rest of the State.

The superintendent of the Norfolk, Philadelphia and New York railway furnishes the following figures. His railway transported from the counties of Accomac and Northampton alone in 1893, 639,369 barrels of potatoes. With those transported by water we may safely say that these two counties sold over 800,000 barrels of potatoes in 1893.

Mr. A. Jeffers, of Norfolk, Va., a recognized authority, sends me the following figures. He says: "In the year 1893 the trucking and market garden interests in the fields thirty miles around Norfolk saved the city from panic, tided our money interests over the crisis, and left our tillers of the soil in fine shape. The potato crop of 1893 brought nearly \$1,500,000 to our people; the strawberry crop brought \$1,000,000; and the aggregate of money received from kale, cabbage, spinach, lettuce, radishes, tomatoes, onions, peas, beans, asparagus, and the many other minor crops, was more than \$500,000, saying nothing of the large local consumption. This great amount of truck was grown mainly in four counties—Norfolk, Nansemond, Princess Anne, and Isle of Wight. Of the grand total Norfolk contributed over \$2,500,000 worth, say \$3,000,000 worth; Nansemond county, \$1,000,000 to \$1,500,000; Princess Anne, \$750,000 to \$1,000,000. Norfolk county without doubt grows the largest cash value of farm products of any county in the United States. It has the largest potato grower. Twenty thousand barrels was raised by him in a single year. Also the largest single corn producer in the South, who produces 50,000 bushels of shelled corn this year.

"Not over half of our truck land is in use. This trucking industry has been developed principally during the past twenty-five years, as prior to 1870 it amounted to little. Its development began with three men from New Jersey, limited in means and experience. The industry in twenty-five years has passed the \$6,000,000 mark per annum. At least three Norfolk county farmers and truckers have dug from the bosom of Mother Earth more than \$500,000."

Last season it required eleven large steamers each week to transport the vegetables from the Lower Rappahannock, a trade which has grown up in the last few years.

Mr. Chairman, there is no part of the United States (I speak advisedly—I am familiar with the resources, climate, and with the conditions of the working people in almost every county of every State east of the Sierra Nevada mountains) there is no part of this country that offers greater advantages to the immigrant than the Tidewater region of Virginia; nowhere else can be obtained more easily not only the necessities, but even the luxuries of life.

In spite of all these natural advantages, and the fact that the assessed value of property increased 30.44 per cent from 1880 to 1890, we find that Virginia only increased 9.48 per cent. in population from 1880 to 1890. The population of the United States increased during the same period 24.86 per cent. The increase in Virginia is less than any State in the Union except Maine, Vermont, and New Hampshire. The average size of farms in Virginia in 1880 was 150 acres, of which 52.2 per cent is unimproved. The average valuation of farming lands in Virginia runs \$13.32 per acre, including fences and buildings.

Of the 502,917 immigrants who came to the United States in the year ending June 30th, 1893, only 583 were bound immediately for Virginia.

Only 1.1 of the population of Virginia is foreign born. How are we to account for this?

I do not believe that Virginia has properly advertised her resources.

If the merchant of the city with the very line of goods was to withdraw the commercial agents he sent out, he would soon find that his wares would remain unsold. Virginia must send competent agents to those sections and to those countries from which she thinks it desirable to draw immigrants. I have talked with immigrants in every section of the west, and have found that in selecting their homes they are either induced to move through some agent, often the agent of some railway who sought them out in their eastern or European homes, or through the influence of some friend or kinsman who had gone before them.

There is a very common impression among these immigrants that the whole south is unhealthy. Yellow and malarial fever being regarded as universal.

They believe the school facilities are poor. These false impressions must be removed. Companies should also be organized to guarantee titles.

In whatsoever direction Virginia can afford to economize she cannot afford to economize in advertising her resources nor in educating her children.

Mr. Chairman, I am an optimist in regard to the future of this country and to the future of this State. It is a beautiful country, and so productive that it is capable of producing forty, fifty, and one hundred-fold more than at present.

It seems to me there should be no serious concern in regard to what is called the race question.

Of the 7,470,040 colored people who lived in the United States in 1890, I find that already 1,801,709 are distributed over what may be called the north and west.

I have had occasion to study quite carefully the ledger of this country. There is no single entry which I have read with greater pleasure than that which gives the number of scholars that the State had enrolled in the public schools in 1880 as 220,733, and in 1890, 342,269 scholars.

In the light of these figures we need have no fear as to the future of Virginia.

WHAT OUR BAD ROADS COST US.

BY CLARENCE COLEMAN, Member of Association of Engineers of Virginia.

In point of conception and invention, and in boldness of execution as builders of the highest type of road known to science and art, the American of the nineteenth century stands pre-eminently in the front rank of the world's road builders. Cities teeming with busy and thriving populations have sprung into existence, moved by the potent sign of the iron cross made by these Knights of the Age of Iron and Steel. Fair fields are yielding rich harvests and paying their tribute to the commerce of the world in places that would have been impossible without the grand crusade of these modern knights who have come, not like the knights of yore leading their captives in their train and bearing their trophies on their shields, but like the Avatar of Progress and Science, leaving their indelible tracks in iron and steel emblazoned on the everlasting rocks.

The capitalist has been so lavish in creating and fostering these pathways of steel, that to-day 170,637 miles of railway in the United States represent in capital and funded debt the enormous and incomprehensible sum of \$10,268,169,042, while the total amount of money in the United States on the first of July, 200,000,000 acres of the public domain and hypothecated its credit for \$100,000,000 in the interest of these vast schemes. Certainly the arteries of the country have been nourished to the neglect of the veins, and as in the physical constitution of the animal organization, these systems of circulation are so correlated that the very existence of the body corporate depends upon their synchronous development and action. So in the body politic, one system of internal improvement created and magnified to the utter exclusion of its correlated part, destroys the equilibrium of its own creation and saps the very foundation of commercial prosperity.

It is no marvel that the human mind has been actually entranced by the magnificent possibilities of the modern railroad. It is no wonder that the tiller of the soil has plodded over miles of highway of miry consistency, and almost fathomless depth to offer his life earnings at the altar of this nineteenth century fetich. We would not depreciate the advance and progress of this great factor in human civilization, nor can we depreciate its transcendent results. It is in accordance with the natural order of things that capital should seek investment in the most skilfully managed concerns, and that it should avoid such ignominious failure as the management of our common roads presents. Had the improvement of our highways kept pace with the development of our railroads, we would have advanced the hands on the clock of progress another hundred years.

There is an aphorism of political economists: "That the civilization and pros-

perity of a State is measured by the condition of its highways." Then, if we are prepared to recognize the value of good roads, we must by an inverse process of reasoning admit the cost of bad roads. If we could follow the differentiations of value in the one case, and of cost in the other, it would not be difficult to determine the result; but the problem presents a moral as well as a mathematical condition, and while it would be interesting to enter into the domain of speculative philosophy and to apply the axiom of cause and effect to each particular ramification of this comprehensive subject, it will perhaps be better suited to our purposes to deal with actual facts as they unfortunately exist with us in this State.

To arrive at any definite conclusions in regard to these facts, it is necessary to institute some basis of comparison, and for this purpose I have selected France as having the most complete and perfect system of highways in the world, and exhibiting a degree of domestic, commercial and financial prosperity which is in a great measure due to the equipoise of her system of internal improvements.

The State of Virginia comprises an area of 40,125 square miles and has a population of 1,655,080, or 41.27 inhabitants for each square mile of area. France, with an area of 204,000 square miles and a population of 38,125,395, has 186.88 inhabitants for each square mile of area. Virginia has a total railroad mileage of 3,426.43, or 11.71 square miles of territory for each mile of railroad. France has a total railroad mileage of 24,018, or 8.49 square miles of area for each mile of railroad; or, reasoning inversely, Virginia has .085 of mileage for each square mile, and France .116 of mileage for each square mile of territory. Virginia has 483.29 inhabitants for each mile of railroad, and France has 1,586.53 of population to each mile of railroad; or Virginia has 10.92 feet of railway to each inhabitant, and France 3.32 feet to each inhabitant.

Thus it is seen that France has a little upwards of five times the area of Virginia, about twenty-three times the total population of Virginia, a little less than five times the population per square mile; but when we compare area with railway mileage, it is found that Virginia has only 3.22 square miles per mile of railroad in excess of France.

While, under the conditions of population in the two countries, the last comparison seems anomalous, we will not need to seek far for the solution. When we consider that France is credited with 130,000 miles of macadam or stone highways as against 689 miles for Virginia, we can appreciate the facilities of transportation possessed in that country outside of its railroads. Thus we would have for France 1.57 square miles of area for each one mile of macadam road; and for Virginia 58.23 square miles for each mile of macadam road.

Again, a comparison of the population of the two countries with the mileage of macadam roads shows 293.27 inhabitants for each mile of macadam road in France, and 2,403.45 inhabitants for each mile in Virginia.

The French nation has certainly given the world assurance of what may be done in the construction and maintenance of highways, and the thrift and prosperity of those people stands as an everlasting monument to their efforts in this direction.

I am well aware of the probable opposition in this State to any plan that carries with it an increase of taxation. Since that eventful night on the 16th of December, 1773, when the partisans of old Samuel Adams went down to Boston harbor and cast overboard the cargoes of tea because tea meant taxation, the average American has had a most decided distaste for any visible form of taxation. He

prefers to take his taxes like the child takes his medicine, disguised by aromatic essences, sweets, and tinctures. He is, in fact, a species of sentimental ostrich, happy with his head in the sand, glorying in the homely saying, "Where ignorance is bliss, 'tis folly to be wise."

Forty years ago little or nothing was known of the pathology of germ diseases. Bacilli and bacteria were unknown. The physician struck out wildly and impotently, fighting a recognized malignant, deadly force, with no knowledge of its nature and no power to resist its effects. And so it is with us. We are battling against an irresistible force in the shape of an invisible but not unfelt taxation, and we are calmly taking our rest in the shade of this deadly upas tree, oblivious of its noxious exhalations. We are annually paying a tribute to our bad roads more onerous in its nature and more certain in its exactions than the oppression which incited Americans to rise and declare themselves free men. Shall we, who proudly refused to be the minions of government, remain forever the slaves of conditions, fettered with the shackles of our own inaction and trammled by the delusion of our hopes?

We plead poverty and inability to raise money for the betterment of our roads and we have been annually expending an amount in money or labor which, under skilful and trained direction would have placed our common roads upon a plane where at least they would not have been a reproach to our civilization.

As near as I can ascertain, there was expended in labor and money on roads in Virginia in the year 1893 an amount approximating \$600,000. So it can be readily seen that we are maintaining our own roads at immense expense, a very small proportion of this money and labor being used in the construction of permanent highways. The treatment may be said to be entirely palliative. Our roads are no better than the year before, and year after year this patchwork goes on, with few permanent results.

Now, let us assume that during the past twenty years \$300,000 had been spent on permanent improvement each year, and that the average cost of this work had been \$1,250 per mile, we would have to-day 4,800 miles of permanent road, or forty-eight miles to each county in the State.

It is stated on good authority that in Union county, N. J., by reason of the improved system of road construction and maintenance, farming lands are estimated at an average of \$206 per acre as against the average value of \$65 per acre for the entire State.

It is not necessary that we should take such an example as that to show what we are paying for our miserable roads, but from very conservative figuring it can be demonstrated that we are paying enough to build and maintain a thorough system of highways throughout the State.

The assessed value of land in Virginia for the year 1893 amounted to \$126,890,053. Now it is certainly reasonable to assume that those values would be increased by not less than 20 per cent with a good system of roads, which would give an increase in value of \$25,398,010 60, interest on which at 6 per cent amounts to \$1,523,880 63. Now that amount of interest represents the increment of a value we should possess under the desired conditions, and is, therefore, an annual charge against the State on account of bad roads.

I have figured from the statistical abstract of the United States for 1893 that our principal crops of corn, wheat, potatoes, and tobacco amount to 1,265,782 tons of 2,000 pounds. I omit all other products, as lumber, mineral and other crops, as

an offset against that part of the crops which may be consumed at home, and, taking 2,000 pounds as an average load and ten miles as the average haul, would give 12,657,820 ton miles, which, at 25 cents per ton mile, represents \$3,164,455 as the total cost of hauling all products to railroad or market. Now if, under the proposed conditions of good highways, the average load can be increased to even 4,000 pounds, then we are again paying each year \$1,582,227 50 for our bad roads. But if we can haul the load of 4,000 pounds in four-fifths of the time required to haul the load of 2,000 pounds on the unimproved road, then we effect a saving in cost of \$612,891, and that amount must be charged to the account of bad roads.

Then taking the assessed value of all vehicles in the State at \$3,051,783 and estimating annual depreciation under present conditions at 10 per cent, it is perfectly reasonable to assume that under the proposed condition 5 per cent would cover depreciation, thus giving another charge of \$151,586 90.

And finally, taking the assessed value of horses and mules at \$13,495,932, and allowing that with good roads, we can reduce the present cost of feeding and depreciation of stock to an extent represented by 3 per cent of value, we have \$404,877 96.

Then we may sum up the annual cost of bad roads in Virginia as follows:

To interest on depreciation of land.....	\$1,523,886 63
To additional cost of hauling.....	1,582,227 50
To loss of time in hauling.....	612,891 00
To depreciation of vehicles.....	151,586 90
To depreciation of horses and mules.....	404,877 96
Chargeable to bad roads.....	<u>\$4,275,463 99</u>

Professor Eley has estimated that the loss per horse per annum on account of bad roads, amounts, in the United States, to \$15, and figures on that basis for the State of Virginia, we would have 290,567 horses at \$15 or \$4,358,505 as the cost of bad roads, or \$14 78 for each horse instead of \$15. I have thought his figures too high until I made these calculations, but I am now convinced that they are perfectly reasonable.

If my reasoning on this subject of the cost of bad roads is correct, we are losing in this State \$11,713 60 for each day in the year, or \$2 58 per annum for each unit of population. If we had the use of the money chargeable to bad roads, we could construct 1,710 miles of the best class of MacAdam roads each year, and in fifteen years our road system would be on a plane with that of France.

According to these figures, our bad roads are costing us \$2,478,918 97 more than the total tax collected in the State, which in 1893 only amounted to \$1,996,545 02, or, considering the total taxable values of the State for 1893, we are paying a little more than 1,068 per cent on that amount.

This invisible but insidious tax is none the less fatal to our prosperity because it is not gathered by the tax collector. On its list there are no delinquents, and there can be no evasion of payment. It reaches every class, creed and condition.

When the Roman emperors built thousands of miles of their magnificent highways all over Europe, they were conferring a priceless boon upon unborn nations, but they were in fact simply emerging from conditions which threatened to destroy their empire and extinguish their greatness. But, nevertheless, those roads remain to-day as examples of the highest art in highway construction and the prae-

